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THE MARINE REVIEW

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THE MARINE REVIEW

VOL. 46 CLEVELAND NOVEMBER, 1916 NEW YORK No. 11

Get the Right Men, Mr. President

Vast Interests Hang on the Selection of Men of Proper Calibre for the United States Shipping Board—No Room for Politicians

IT IS entirely possible that the exigencies of campaign politics will require postponement of the announcement of the personnel of the new shipping board until after the first Tuesday in November. In the meantime, the names of various estimable gentlemen have been mentioned, all of whom possess more or less capacity for the offices to be filled. But in no case have any of the acknowledged leaders of American maritime affairs been considered and the fear is spreading that the board will finally be made up of well intentioned men of no more than ordinary ability. It is not too late, however, for the marine interests of the country to bestir themselves and insist on a shipping board of the highest calibre.

The Board Will Chart Its Own Course

Against the advice of the best informed leaders in the country, the government passed the shipping bill ostensibly to rehabilitate American maritime commerce under the American flag. At the same time the language of the act, as finally passed, had been so altered from the original draft that the door is left wide open for the shipping board to take almost any course it sees fit. The board may, if blessed with sufficient wisdom, boost the American merchant marine one knot farther along the fairway to permanent prosperity, or it may, just as easily, plant a few contact mines in the same fairway. It will rest with the judgment, wisdom and experience of the individual members of the board yet to be appointed to determine whether the shipping bill is to become a positive menace to our maritime progress or not.

Big Two-Fisted Leaders are Needed

For this reason men of ordinary ability or even men above the average will not do. The shipping board is to reconstruct the maritime policy of the United States. None but men of extraordinary capacity and experience in the affairs of the sea, tried and tested leaders, are eligible.

Simply an Invitation to Hard Work

These men are needed, and judging by the qualifications of some of the candidates openly in the field, sadly needed, if the shipping act is to be kept off the rocks. It is true that there is nothing in the emoluments or perquisites of the offices in question to attract men of the character required. Their acceptance would involve distinct sacrifices of personal fortunes and ambitions in each case. Yet such is our faith in the fundamental patriotism of our maritime leaders that we have no doubt about the possibility of securing acceptances.

The problem, we believe, is important enough to absorb a large amount of the President's time—even just before election. The kind of men the President needs will not seek him out, directly or indirectly.

A Military Funeral

The two most pernicious features of the shipping bill, in fact we might say the only really dangerous provisions in the act as it went to the engrossing clerk, are, of course, the arrangements for the government ownership and operation of steamship lines and the removal of protection in the coastwise trade. But even these provisions may be administered in such a manner that their operations will not be specially injurious. If the shipping board should be composed of men of ripe experience and mature judgment in marine affairs, the maritime world might even look to it for advice and assistance. If, on the other hand, the administration of this act is turned over to theoretical enthusiasts we might as well hold a military funeral for our merchant fleet.

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Seattle Yards Launch First Ships

Ship Builders in the Northwest Establish Several New Records During Past Few Weeks—First of Vessels Intended for Service on the Atlantic is Launched

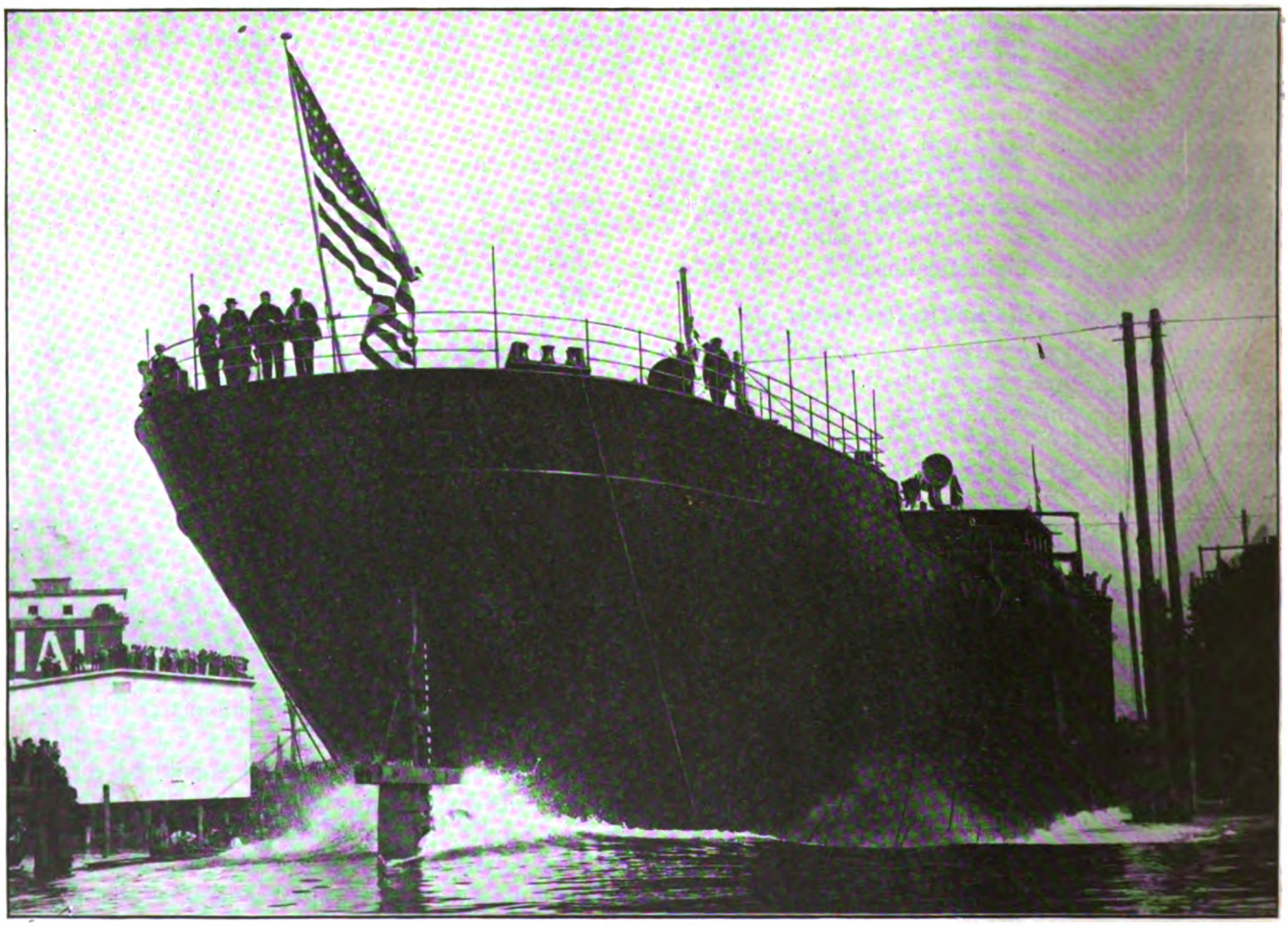
By R. C. Hil

PUGET sound ship yards are now enjoying the greatest prosperity in their history. Tangible evidence of this fact was given a few weeks ago, when the first launchings during this period of activity took place.

On Sept. 21, the Norwegian steamship NIELS NIELSEN was launched from the yards of the Skinner-Eddy Corporation at Seattle. She is being built to the order of B. Stolt-Nielsen, Haugesand, Norway. Two days later the American steamship CAUTO was successfully sent down the ways at the plant of the Seattle Construction & Dry Dock Co. and will shortly be added to the fine fleet now operated by the New York & Cuban Mail Steamship Co.

Each of these vessels establishes a new record for Seattle yards. In fact, several records attach to NIELS NIELSEN, for this vessel was built more speedily than any previous product of Seattle yards, her keel having been laid last May. NIELS NIELSEN is not only the first ship turned out by the Skinner-Eddy Corporation, and the first built at Seattle for foreign owners, but she is also the largest merchant vessel ever constructed on Puget sound. This vessel has a deadweight capacity of 8,800 tons, or 12,500 tons measurement. Her dimensions are: Length, 423.9 feet; beam, 54 feet, and depth, 29.9 feet. Her sister ship, HANNA NIELSEN, will be launched within a month, by which time NIELS NIELSEN will be ready for service. At the same yard eight or 10 additional steamers for various foreign and American owners will be built.

CAUTO, which is a combined passenger and freight carrier of 7,500 tons, will be used between New York and Cuban ports. She is the first of two being built by the Seattle Construction & Dry Dock Co., construction work on PANUCO being so well along that she will be ready for launching in about four weeks. These vessels are each 368 feet in length, with beam of 47.9 feet and depth of 27.3 feet and speed of 12 knots. CAUTO and PANUCO bear the distinction of being the first vessels built in Seattle, intended for operation on the Atlantic. The same yards have well under way a $1,000,000 freighter for the Luckenbach line, New York, as well as a large fleet for the United States navy, foreign owners and others. Two steamers, being built for Norwegian owners, flanked CAUTO as she glided into the waters of Puget sound. CAUTO was christened by Miss Dorothy Alexander, daughter of H. F. Alexander, president of the newly organized Pacific Steamship Co., which has taken over the coastwise fleets of the Pacific-Alaska Navigation Co. and the Pacific Coast Steamship Co. Mr. Alexander is today the most prominent figure in Pacific coast shipping, having risen from the president of a company operating two small steamships 10 years



THE LARGEST MERCHANT VESSEL EVER BUILT ON PUGET SOUND

—From Webster & Stevens, Seattle.

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ago to the head of a merger which includes 25 large vessels today.

In addition to the tonnage being constructed at the Seattle yards mentioned above, J. F. Duthie & Co. are establishing an extensive ship building plant there, having already received contracts from Norwegian owners to build five modern freighters, each to cost $1,000,000. This yard will be located but a short distance from the Skinner-Eddy plant and that of the Seattle Construction & Dry Dock Co.

Soo Canal Report

The report of commerce passing through the Soo canals during September shows that during that period 3,439 vessels were locked through, the total freight carried aggregating 12,906,524 net tons. Of this freight, 2,376,199 tons went through the Canadian canal and 10,530,325 tons through the American canal. Below is a summary of the total movement up to Oct. 1 of the present season, with comparative data for 1915:

EAST BOUND.

	To Oct. 1, 1916.	To Oct. 1, 1915.
Copper, net tons.....	83,669	95,373
Grain, oth. than wheat, bushels	61,318,486	25,504,353
Flour, barrels	6,533,889	5,091,107
Iron ore, net tons....	47,370,170	33,761,752
Pig iron, net tons.....	29,696	6,914
Lumber, M. ft. B. M.	251,399	353,068
Wheat, bushels	156,735,884	66,538,726
Unclass. frgt., net tons	221,984	211,371
Passengers, number ..	27,126	21,725

WEST BOUND

Coal, anthracite, net tons	1,609,481	1,448,734
Coal, bituminous, net tons	11,030,178	8,106,063
Flour, barrels	13,230	100
Grain, bushels	4,710	31,250
Mfctd. iron, net tons.	116,441	134,137
Iron ore, net tons....	28,927	.....
Salt, barrels	572,489	481,170
Unclass. frgt., net tons	837,873	882,375
Passengers, number...	26,384	23,959

SUMMARY OF TOTAL MOVEMENT.

East bound, net tons.	54,645,624	37,739,738
West bound, net tons.	13,809,873	10,643,865
Total	68,455,497	48,383,603
Vessel passages	18,845	14,907
Net registered tonnage	51,701,240	38,578,998

Subsidies Are Planned

Japan and Canada Aid Ship Builders—Japan Encourages Shipping Over North American Routes

SUBSIDIES to shipping on practically all routes are included in the budget of Japan for 1916-17, provision being made for financial aid from the government in some cases as far ahead as 1920. The maximum subsidies are awarded on a graduated scale declining until 1920, the amounts to be granted each year to be computed according to the profits at the end of each fiscal year. It will be noted in the table presented below that the largest subsidies are paid to the North American lines. The allotment of these grants by routes follows, the figures indicating the maximum subsidy available:

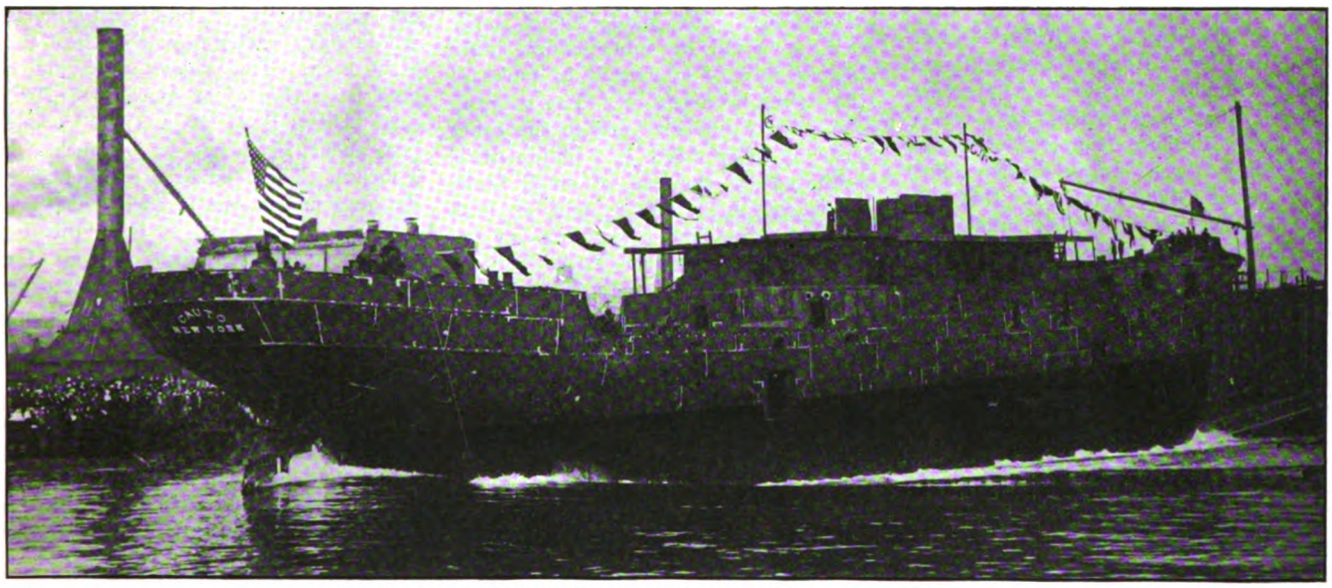
AMOUNT APPROPRIATED AS MAXIMUM SUBSIDY

	1916-17.	1917-18.	1918-19.	1919-20.
Europe..	$902,331	$875,590	$841,543	$781,697
North America	1,468,608	1,395,455	1,329,623	1,249,575
South America	148,184	144,973	141,862	134,136
Australia	86,556	79,866	84,396	93,872
South Sea	139,440	139,440	.....	.....
Dairen...	49,800	49,000	.....	.....
Japan Sea	125,247	120,267	.....	.....
China....	267,924	267,924	.....	.....
Shanghai.	107,070	107,070	55,535	.....
Line connecting with Hokkaido	24,900	24,900	12,416	.....
No. China	58,266	58,266	23,453	.....
Coastwise lines....	58,146	58,146	.....	.....
Formosan lines....	808,956	508,956	508,956	.....

The Japanese government has granted permission to the Toyo Kisen Kaisha to revise its freight and passenger rates between Japan, San Francisco and South America and to adopt the American system of computation, as compared with the price charged by British firms. Subsidies are also proposed by the government of British Columbia. Several municipalities and the Nova Scotian government will grant free sites to ship builders and exempt the land from taxation.

Ship building in Canada will shortly be augmented by the establishment of yards by some of the leading British companies. Already Vickers and Yarrows, of Scotstoun, and Sir W. Armstring, Whitworth & Co. are at work there, and now it is learned that Cammell, Laird & Co., Birkenhead, and John Brown & Co., Clydebank, intend to open yards.

The dominion government proposes to grant a tonnage bounty to equalize the difference in cost of construction, making the dollar instead of the English pound the basis of quotation.



BUILT IN SEATTLE FOR SERVICE ON THE ATLANTIC

Will Enlarge Ship Yard

The Standard Shipbuilding Corporation, 44 Whitehall street, New York, has drafted plans for an extensive enlargement of its ship building plant at Shooter's island, adjacent to Staten island, N. Y. Action on these plans will be taken before the end of October and the work of improvement then will be pushed as rapidly as possible. The company has applied to the state of New Jersey for the privilege of utilizing submerged flats in the neighborhood of Shooter's island. Contracts now on the books of the Standard company involve seven 7,300-ton vessels.

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Cutting Costs in Our Navy Yards

When Efficiency Became Known to the Navy, Many Instances of Uneconomical Practice Were Exposed—This Article Shows How Simple Changes Saved Money

THE joker that wondered if there were "three feet in the Boston yard" might be surprised now to find that there are three, and, as in the other navy yards, hands and brains also, as will be shown by the following (the instances cited did not take place at Boston):

A "leak stopper" is a cylindrical cushion filled with cellulose. It has a hole through the axis through which is passed a steel rod with a hinged cross-piece at the end. By squeezing the cushion up against a hole in a ship, water is kept out. Three years ago a "live" naval constructor made a little investigation all by himself into the leak stopper question and made valuable discoveries. He discovered that large battleships carried ten boxes of leak stoppers, each box containing three stoppers; that they cost about $100 per box; that the patent had expired; that under no conceivable conditions could a ship use more than three boxes of stoppers; that they could be made in a navy yard for $20 a box. The net result was that a ship could be supplied with all the leak stoppers it needed for $60 when it had been paying $1,000. The navy department is making use of this "discovery" which in 10 years should save $100,000.

The same man observed that each navy yard was buying some compressed oxygen for use in oxy-acetylene welding and cutting, and making some at high cost which was stored

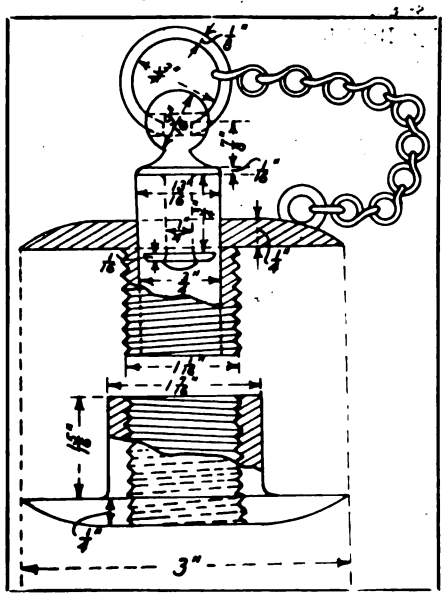

FIG. 1 ORIGINAL DESIGN FOR BOAT PLUGS

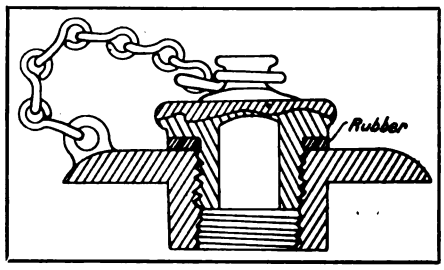

FIG. 2 BOAT PLUG COSTING TWENTY CENTS

in tanks at 300 pounds pressure. He conceived the idea of having the oxygen all made at one yard, where, on account of being made on a large scale, it could be made much more cheaply, and of storing it in tanks of 1,800 pounds pressure. The oxygen is shipped from this yard to the other yards as they need it. Shipment is facilitated by the use of small tanks which contain more oxygen at high pressure than the larger tanks at the low pressure. As the tanks become empty they are returned for refilling. This has resulted in a large saving.

Kapok Saves $1,000 per Ship

Kapok, which strongly resembles cotton, is obtained from the pod of a tree that flourishes in the East Indies, the best kapok coming from Java. Kapok has the distinction of being the most buoyant solid known, one pound of it having a buoyancy of more than 20 pounds. This is about the buoyancy of a cork life jacket which weighs over seven pounds. Kapok, moreover, is of an oily nature repellant to vermin. It was therefore suggested as a filling for hammock mattresses for use on board ship. While every ship carried a large number of life preservers of cork they would usually be hard to find when it became necessary to abandon ship in a hurry. On the other hand when submarines attack, which is usually at night or in the early morning, when the sailors are in their hammocks they do not have to rub their dazed eyes at the abandon ship "Siren," and try to remember where the life preservers are stowed. Each man need merely grab his mattress and jump overboard, each mattress having enough buoyancy to keep all but the heaviest completely out of the water. After two years of investigation, the navy department has adopted the suggestion and now requires kapok mattresses, reducing the number of cork life preservers. This will result in a saving on each large ship of about $1,000.

"Transportable Rifle Racks" are wooden boxes without top or bottom, about four feet long by 16 inches wide by 8 inches deep. Each box carries six rifles. Each large ship carries about 200 of these racks which are kept in the armory full of rifles ready for quick use. Each navy yard formerly made these racks in small numbers as required, the racks frequently costing $10.00 each, and seldom, if ever, under $5.00. By simplifying the design, by carefully planning the work, and by manufacturing in quantity at one yard for the whole navy racks now cost less than $1.50 each. This shows a saving on each large ship of as much as $1,700.

A "Ditty Box" is a small wooden box about 10 inches by 12 inches by 9 inches. These boxes are provided by the government, one to each member of the crew of a ship. It is in this box that the sailorman locks all his love letters and his monogram notepaper, ink, pen and photographs of loved ones or stage favorite. He uses it also as a desk to write upon. Twelve years ago each yard made ditty boxes as required, made them of cherry, coated them thickly with varnish, polished them highly and invoiced them to the ships at $7.00 plus, per. After two months' use no one could tell that they had been varnished. The manufacture of

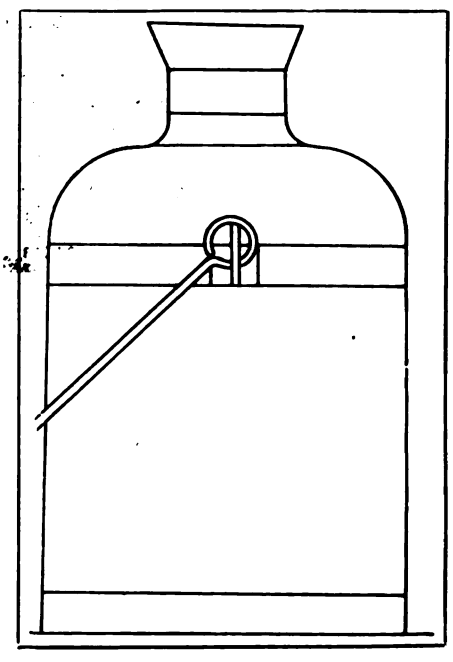

FIG. 3—ORIGINAL DESIGN OF DRAIN BUCKET

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these boxes is now concentrated at one or two yards and they are costing about $1.60 each, and are made of beech, birch and maple. Equipping a modern super-dreadnought with the old time boxes made in the old way would cost $6,500.00 more than the present method.

Almost any "dub" can tell No. 1 lumber when he sees it. If, for instance, the "dub" sees a plank with a knot in it he will know that the plank is not No. 1. It takes an expert to pick out No. 3. If a requisition calls for No. 3 pine, the inspector must protect the government by not allowing the dealer to "palm off" No. 4 pine on him. On the other hand, he musn't "soak" the dealer by making him furnish No. 2 material when the price was based on No. 3. Until within a few years, the navy always used the best lumber, regardless of the purpose for which it was required. No. 1 white pine was used equally for furniture backs, patterns, templates, etc.; this material costing $90 per thousand feet, board measure. Perhaps the main reason was the ease with which inspection could be made in purchasing. Doubtless, however, little thought was given to the question of using wood most efficiently, —that is, using for each purpose, wood that was not the best obtainable, but was good enough for that particular purpose. One of the small yards now uses every year 200,000 feet of pine costing $30 to $35 a thousand where formerly only the best material was used. This means a saving each year at this yard alone, on only one kind of wood of $12,000.00. The saving on wood for the entire navy probably reaches close to $500,000.00 a year.

Cutting the Cost of Squilgees

What is true of wood is true likewise of other materials. Improvement doesn't come all at once. Gradually, however, it is becoming the practice to ask, not "what is the best," but "what is good enough?" A "squilgee" is a hoe-shaped article with a rubber blade, and is used for removing the water from decks after scrubbing. This rubber blade, made of the best para rubber used to cost 45 cents. A little effort resulted in finding a rubber blade that costs 16 cents, and easily outlasts the wooden holder.

A large number of articles and fittings required on vessels have now been standardized, and the manufacture of many of them assigned to yards so that one yard will manufacture all of a fitting that is required in the service. In this way enough articles of a kind are manufactured at one time to make it worth while to make dies, jigs and special machinery for manufacturing cheaply. The yard to which an article is "assigned" usually also makes a study of the article with a view to simplifying design so as to make manufacture easier, while the question of material to be used is also carefully studied and the cheapest suitable material used.

As examples of where the design was simplified, the following are cited,—

Crew's mess tables are made of wood with steel legs. The leg fittings are secured with rivets through the table, brass washers being let into the top of the table, so as to be flush. These brass washers had formerly square corners, necessitating much chisel work in inlaying. The corners now are rounded and the inlaying is done with a simple roughing bit, it being unnecessary to touch a chisel.

Boat plugs, taken out to allow a boat to drain after being removed from the water formerly were as shown in Fig. 1, and cost about $2.00. They were inefficient as the stopper was liable to be kicked out accidentally by one of the rowers when the boat was in the water. The boat plug now standard, shown in Fig. 2, cannot be kicked out, and costs only 20 cents.

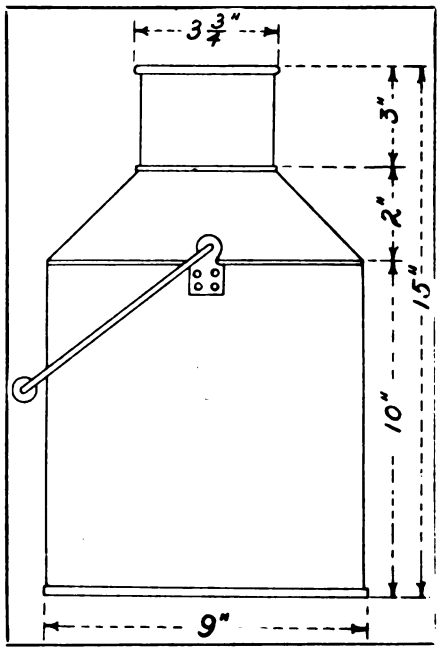

FIG. 4—REVISED TYPE OF DRAIN BUCKET

The construction corps of the navy, upon which navy yard work largely devolves, is so small numerically, and the quantity of work required of it is so great that the members of the corps have to work at high pressure and give snap judgment largely in order to get the work done at all. Conditions are not such as to permit them to give nearly so much time as they would like to the study of methods. The results of thought, however, are so astonishingly great as to lead the writer to the positive conclusion that, without any exception, every feature of navy yards, management, organization, etc., and naval construction is subject to betterment by study. That this conclusion is more or less general is evidenced by the continuous progress that is being made in every direction. The writer now accepts no plan, process nor method at its face value, but, using it as a basis proceeds to add and subtract until the final result satisfies.

Bottle racks are used in dispensaries on board naval vessels to hold about 60 bottles of 3 different sizes. They are held in place by 4 spring clips at the bottom and a bar near the top. These clips varied in length with the size of the bottle. By a few changes in design, making all the clips of the same length, simplifying the curve of the clips, etc., the cost was reduced from $22, to $10, much to the surprise of the writer who had expected no such result.

Even objects that appear the most insignificant repay study. Fig. 3 shows a drain bucket used under scuttle butts on destroyers. It cost $8.50 and was made only in navy yards. The neck is small—for the same reason that the neck of milk cans is small—to prevent sloshing. Manufacturers of commercial buckets, upon being questioned stated that the bucket shown in Fig. 3 was expensive to make on account of the curved breast, but that the bucket shown in Fig. 4 could be made for $1.80. The latter type is perfectly suitable and will be used.

Probably no one subject has received so much general attention at navy yards as the building of small boats. Competition has been of the keenest and now all the yards are very proficient. As a result of the competition 16-foot dinghies that once cost over $700.00 at one yard have now been built for $140.00. The reduction in cost of other boats has been in proportion.

Improved Scuttle Butt

As an example of the tearing down and building up process take the scuttle butt in Fig. 5. A scuttle butt is a water cooler holding 100 gallons of water cooled by coils from the ice machine. Fig. 6 shows how the defects in Fig. 5 listed below are overcome.

It has no vent.

It has to be practically dismantled and the sheathing removed in order to open it. The bolts holding down the top cannot be removed without first removing the ceiling which encloses the cork slabs.

The supply pipe has to be disconnected before it is possible to take off the top.

The material of the scuttle butt is much too heavy, being heavy enough for a boiler, whereas the plating is not even subject to pressure due to the

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head of the gravity tanks, on account of the automatic valve.

The cooling coils cannot be removed without disturbing the ceiling and insulation at the bottom.

The two heavy plates at the bottom of the scuttle butt, above and below the insulation, are undesirable if they can be avoided. Fig. 6 shows how they can be avoided.

There is a long lead of piping from the scuttle butt to the drinking geyser. The water standing in this piping gets warm, necessitating in the course of the day quite a waste of water to obtain a cool drink.

The geysers are not sanitary. The lips of the drinker frequently touch the inside funnel as well as the nozzle. The self-closing cock is said on board ship to require frequent overhauling. The type of geysers shown on Fig. 6 is similar to that fitted to the experimental scuttle butt on SOUTH CAROLINA, these geysers having been installed at the Norfolk navy yard. It is reported on the vessel that they are very much more satisfactory than those according to the standard plan and that they require very much less attention to keep in good condition. The modifications of the Norfolk type that are embodied on the enclosed plans are those that have suggested themselves after an investigation of the experimental installation on SOUTH CAROLINA.

No drip pan is fitted on the experimental scuttle butt on SOUTH CAROLINA. The omission of the drip pan is said to be a complete success. The scuttle butt is located over a tilted space, and the waste funnel of the drinking geyser is large enough to catch all the drip. The waste funnel of the proposed geyser is somewhat larger than that tested on SOUTH CAROLINA. The drip pan is at best an unsanitary as well as unsatisfactory feature. The angle iron ring around the bottom of the scuttle butt rusts out badly in the vicinity of the geysers. Water finds its way behind the toe of the angle, rusting out the celling as well as the angle. This construction is not used in the proposed type.

The hand holes in the top and bottom of the scuttle butt are an unnecessary expense. The pipe plug shown in Fig. 6 is sufficient for ordinary drainage, while the ease with which the top can be removed facilitates periodical cleaning out of the scuttle butt. It will be noted that the supply pipe has been led in through the side of the scuttle butt, so as to leave the top free. It will be noted that the reinforcing rings at various points in the scuttle butts are acetylene welded thereto, permitting the pipe to be removed and replaced without any interference with the insulation or sheathing.

The unsatisfactory method of con-

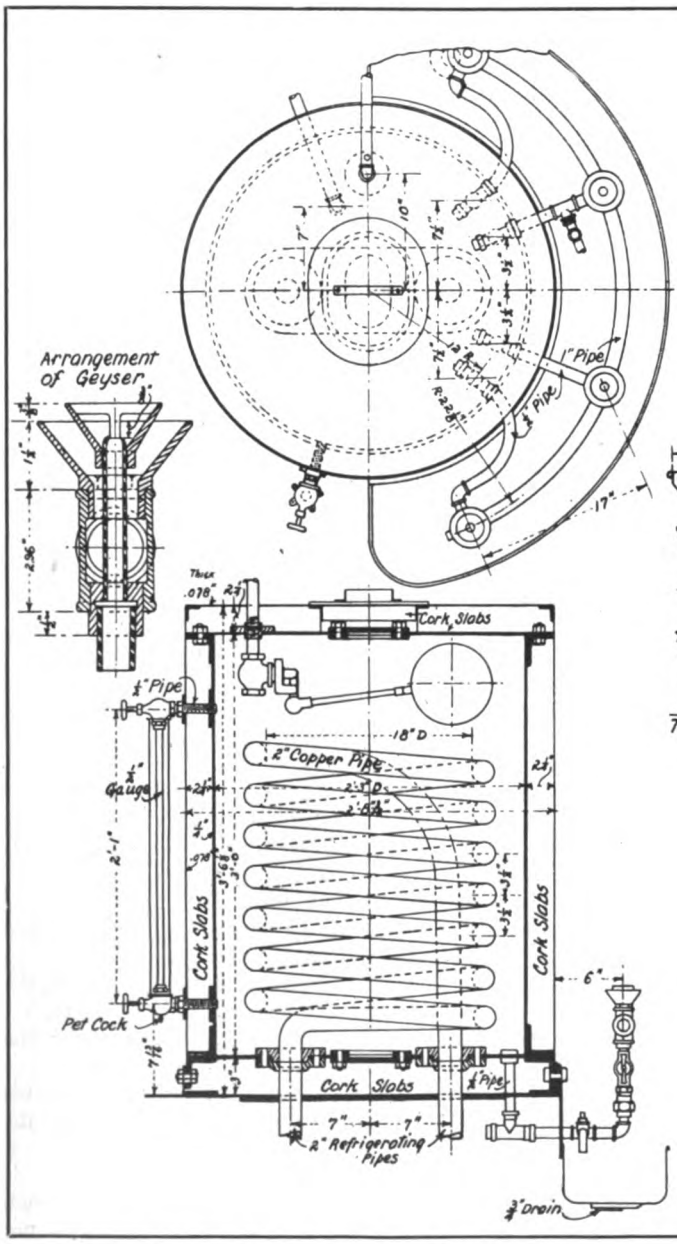

FIG. 5—OLD TYPE OF SCUTTLE BUTT

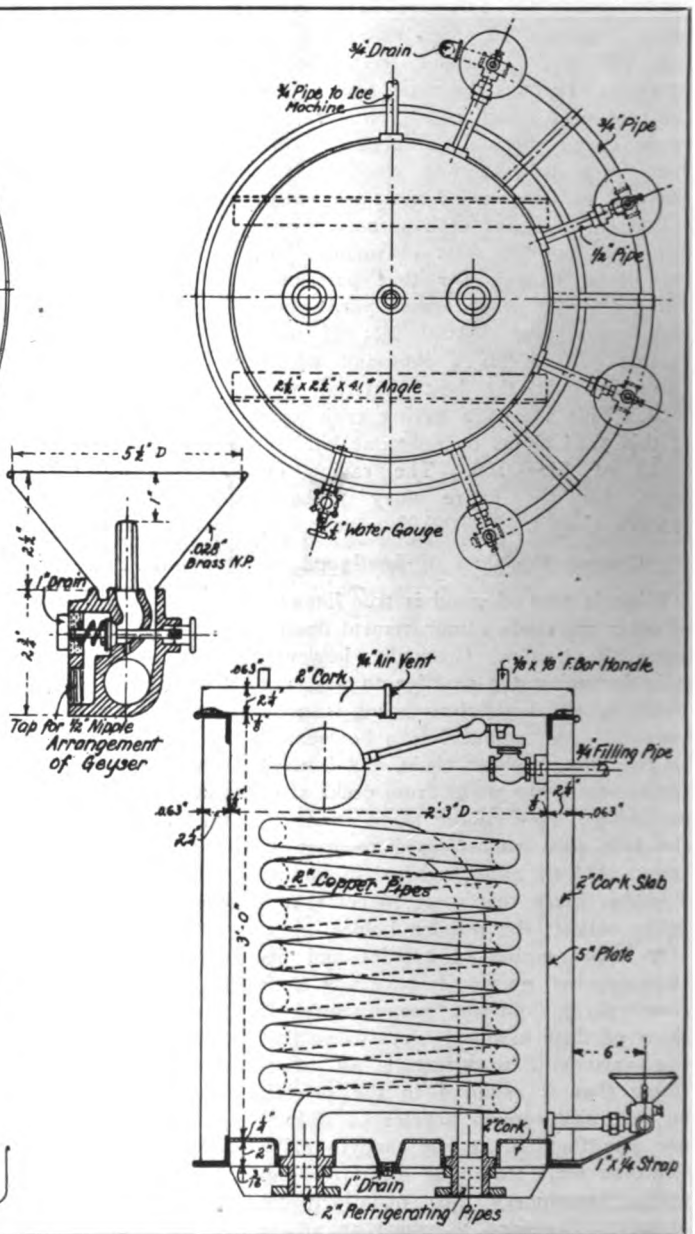

FIG. 6—IMPROVED SCUTTLE BUTT

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necting up the lower end of the coils has been obviated in Fig. 6, the method of connecting as there shown being as suggested by the machinery division at the Norfolk yard, and approved.

It has been found by actual experience to be a most expensive job to repair this scuttle butt; in fact to make even minor repairs seems nearly as expensive as to make a new scuttle butt. The cause of this is largely the design of the present scuttle butt, the design making it necessary to disturb the insulation in order to get into the scuttle butt. It is believed that the scuttle butt will never be satisfactory until it has been changed so as to give free access without disturbing the insulation.

The William Cramp & Sons Ship & Engine Building Co. quote a price of over $600.00 apiece on scuttle butts of the standard design. It is estimated that the proposed scuttle butts can be manufactured at Norfolk at $160.

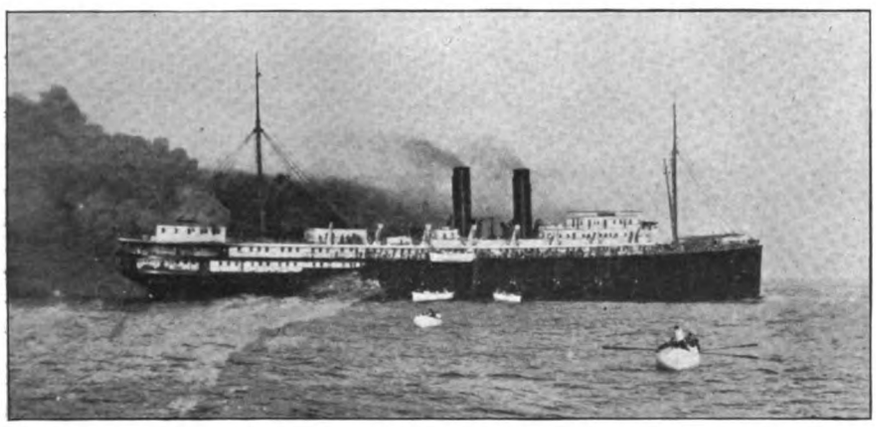
Fire Damages Big Coaster

THE American steamship CONGRESS, largest vessel operating in the coastwise trade, was partially destroyed by fire on the afternoon of Sept. 14, while off the Oregon coast. Fortunately all of the 253 passengers and 175 members of the crew were landed safely. The chief engineer was overcome by smoke and a member of the crew suffered likewise in saving the chief. Favorable weather conditions permitted the rescue to be made so successfully.

Since being built in 1913 at Camden, N. J., CONGRESS has been operating regularly between Seattle and southern California, by way of San Francisco. She was of 7,985 tons, 424 feet long, and 55 feet beam. On her final voyage she left San Francisco at noon Sept. 13. On the next afternoon at 3 o'clock, fire was discovered in No. 3 hatch. The vessel was making full speed at the time, 20 miles from shore. As the flames gained rapidly, Capt. N. E. Cousins, hero of the fire aboard the steamship QUEEN, in 1904, ordered CONGRESS headed for Coos bay, Oregon. As she approached the land, the anchors were dropped and passengers and crew, with the decks growing hot under their feet and dense, black smoke issuing from the stern, were hastily yet without confusion, placed in the lifeboats. The government dredge COL. P. S. MICHIE, working off the bar, hastened to the rescue and the survivors were taken aboard and later sent ashore to Marshfield, Ore., where the residents opened their homes to the rescued. The next day they were brought to Seattle on a special train provided by the Pacific Coast Steamship Co., owner of CONGRESS.

Burned Several Days

The burning hulk continued to burn for several days. It was then towed inside the harbor. Temporary repairs are now being made and it is expected that the steamer will shortly come to Seattle under her own power to be rebuilt at a probable cost of $750,000. The origin of the fire is unknown and an investigation has not explained the mystery.



AMERICAN STEAMSHIP CONGRESS AFIRE OFF COOS BAY, ORE., SEPT. 14

Supplement to Coast Pilot

The coast and geodetic survey has issued a supplement to the fifth edition of the *Alaska Coast Pilot,* Part 1, from Dixon entrance to Yakutat bay. This pamphlet covers all changes and additions made since the publication of the *Coast Pilot.* It is being supplied free of charge on application.

Ore Shipments

Ore shipments during September aggregated 9,600,786 tons, establishing a new record for that month and exceeding the previous high mark, set in September, 1915, by 1,737,640 tons. The total movement for the season up to Oct. 1 amounted to 48,816,650 tons, and it is practically certain, therefore, that the season's shipments will reach the 60,000,000-ton mark. During 1915, 11,649,238 tons were brought down from Oct. 1 up to the close of navigation and a repetition of this performance in 1916 will bring total shipments in excess of 60,000,000 tons. Furthermore, tonnage is being offered more freely than at any time since the beginning of the season, and some shippers are confident that the season's movement will approximate 63,000,000 tons. In order to accomplish this, the fleet would have to carry about 14,000,000 tons from October 1 to the close of navigation.

Following are the shipments by ports during September and the movement to Oct. 1 during the present year, with comparative data for 1915:

Port.	September, 1915.	September, 1916.
Escanaba	1,015,820	922,517
Marquette	539,879	557,140
Ashland	1,028,363	1,255,328
Superior	1,557,935	1,945,171
Duluth	2,428,689	3,455,611
Two Harbors	1,292,460	1,465,019
	7,863,146	9,600,786
1916 increase	.....	1,737,640

Port.	To Oct. 1, 1915.	To Oct. 1, 1916.
Escanaba	4,011,682	5,630,994
Marquette	2,313,532	3,026,845
Ashland	3,829,582	6,051,712
Superior	5,997,023	9,760,966
Duluth	11,807,219	16,174,159
Two Harbors	6,710,528	8,171,974
	34,669,566	48,816,650
1916 increase	.....	14,147,084

Book Review

The Submarine Torpedo Boat, by Allen Hoar; cloth, 211 pages, 7¾ x 5¼ inches; 88 illustrations; published by D. Van Nostrand Co., and furnished by *The Marine Review* for $2 net.

At no time in the history of the submarine has it played so important a role as it has since the beginning of the European war. Therefore a volume on the characteristics and modern development of the submarine is of greater interest to the general public at the present than at any previous time. Using non-technical language as much as is possible, the author gives the history of the submarine up to its present stage of development and a description of the various types of submarines and submersibles used by this and other countries. One chapter is devoted to an exposition of the general factors to be considered in laying down the design of a submarine, that is, of any vessel capable of navigation when

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completely submerged. Also there is a very interesting chapter on the motive power used in submarines. The various systems of propulsion are described and compared, the advantages and disadvantages of each being discussed. Submarine warfare and the important position occupied in it by the torpedo forms the subject matter of three chapters, while the remainder of the book is devoted to a description of tenders and salvage ships, a list of the accidents which have occurred in connection with the submarine, and a short chapter on submarine mines.

Capt. Alexander McDougall

THE Great Lakes have nurtured many romantic careers, and among them none have more elements of interest than that of Capt. Alexander McDougall, "the man who built the whaleback." Although well along in years Capt. McDougall is as active as ever and is now a resident of Duluth.

The idea of the whaleback was to attain maximum carrying capacity, combined with inherent qualities which would make the vessel impervious to wind. What this strange design has attained in this direction is a matter of record for all time in shipping annals.

In 1892, before the larger St. Lawrence canals were built, three of his large whaleback boats were sent to sea, to cross the Atlantic. Later some of them found their way to the Pacific coast. As no pilot could be found to take them down from the Great Lakes to tidewater, Capt. McDougall undertook to learn the work, and safely ran out the vessels. Before the deep, wide channels to Lake Superior were constructed, he built 40 whaleback vessels. Later, when it was made possible for all classes of vessels to travel to and from Lake Superior, the clamshell system for loading and unloading iron ore and coal was introduced. As the rounded deck of the whaleback was not so well suited for the clamshell, the whaleback construction was stopped, but the vessels are still to be seen doing good work. Among sailors along the lakes they are familiarly dubbed "hogs."

The Christopher Columbus

Among Capt. McDougall's greatest achievements was a whaleback passenger vessel built for the Chicago world's fair, with a guarantee that she would be launched within three months, make 20 miles an hour, and be able to take on or unload 5,000 passengers inside five minutes. This guarantee was carried out. In fact, over 7,000 persons were allowed on board on the trial trip, probably the largest number of people ever on one vessel. During 1893, at the worlds fair, CHRISTOPHER COLUMBUS, as the vessel is called, carried 1,700,000 people. After the fair she entered on a long career as an excursion boat between Chicago and Milwaukee, her government allowance being fixed at the enormous number of 4,000 people. After the EASTLAND disaster she demonstrated her stability by successfully undergoing a remarkable careening test.

Capt. McDougall has had an extraordinary career. He had been sailor, mate, pilot, captain, contracting stevedore, vessel agent, and steamship line manager. He has helped to plan and build, for the Great Lakes, the Mississippi river, and the Atlantic and Pacific coasts, more than 100 ships, worth over $8,000,000. He is also the author of an extremely interesting and authoritative report upon freight vessels and navigation on the Mississippi river, which he prepared for a commission of United states engineers who were looking, in 1911, for boat plans to meet the special difficulties of that capricious waterway.

THE MAN WHO BUILT THE WHALEBACK

Previous to this he had built one steamer and two barges, all steel vessels, at a total cost of $125,914, for work on the Mississippi river; and in 1900 these were loaded with the largest cargoes that ever went down that river. These cargoes were successfully delivered at New Orleans at half the rate of insurance for both ship and cargo that any vessel had ever obtained on that river.

Exemptions Continued

Being desirous that no change be made in the American registry act of Aug. 18, 1914, representatives of shipping interests were successful in their pleas before former Assistant Secretary of Commerce Sweet that the act be extended another year. Mr. Sweet caused the petitions of the shippers to be laid before President Wilson with the result that the latter has issued an order in compliance with their request. The act was passed because of conditions following the outbreak of war and was to remain in effect two years, but will be continued for another year, as the result of the executive order. It waives the application of domestic laws as to the survey, inspection and measurement of foreign-built vessels taking out American registry. The order also suspends the law prescribing that the watch officers of vessels of the United States registered for foreign trade shall be citizens of the United States until such time as the officers can become naturalized Americans.

The petitioning shipping interests included the United States Steel Products Co., the United Fruit Co., the Standard Oil Co. and Parker Kirlin, admiralty lawyer, New York.

A High Price

The steamer SUFFOLK, owned by the Coastwise Transportation Co., Boston, has been chartered for five years to a Philadelphia concern at an annual rate of $500,000, according to a recent announcement. The rate is believed by marine brokers to be the highest on record for a vessel of her size over such a term of years. SUFFOLK will be employed in carrying coal from Philadelphia to South America, returning with manganese ore.

Ore Receipts

Ore receipts at Lake Erie ports during September amounted to 7,871,551 gross tons, out of a total shipment by lake from the Lake Superior region of 9,600,786 tons. Receipts by ports were as follows:

Port.	September, 1916.
Buffalo	1,039,646
Erie	202,179
Conneaut	1,399,508
Ashtabula	1,880 508
Fairport	349,331
Cleveland	1,707,268
Lorain	715,960
Huron	271,781
Toledo	254,779
Detroit	50,591
Total	7,871,551

After being in commission for 52 years, the revenue cutter WOODBURY, launched in Philadelphia in 1864, has been sold, converted into a schooner barge and renamed LAKSCO.

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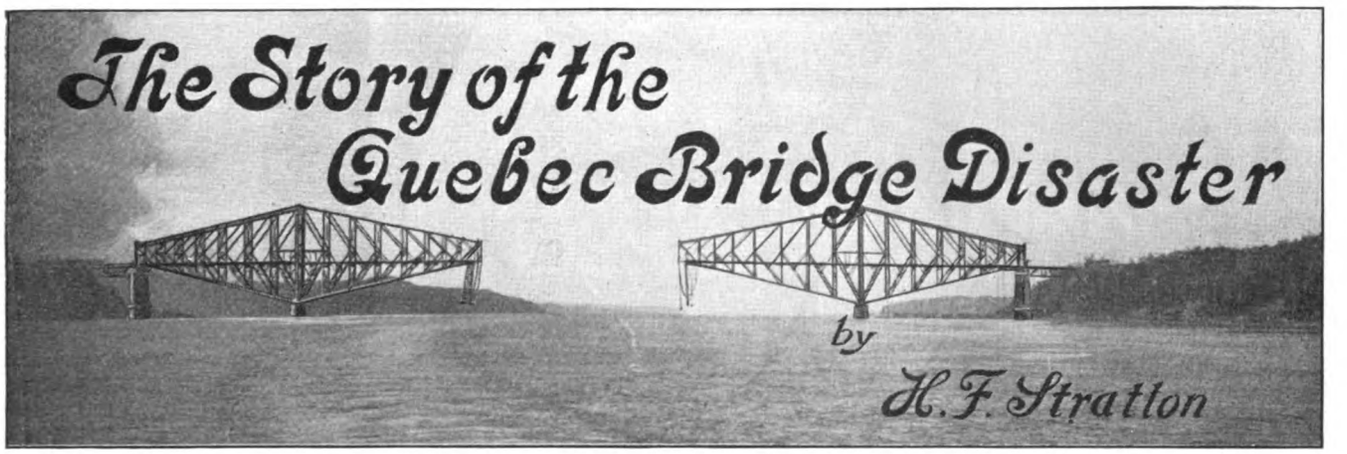
The Story of the Quebec Bridge Disaster



by H. F. Stratton

Fig. 1—View of Bridge from East Side of the Cantilevers Saturday Morning

I WAS in a group of about 20 spectators who, in addition to the workmen, were on the outermost end of the north cantilever when the center span fell into the St. Lawrence river. While deeply sympathizing with the loss of life and property, this thing sticks in my memory as a gigantic spectacle rather than a tragedy, probably because we on the bridge were busy attempting to save ourselves, while those on shore saw men falling through the air and some felt the fear that friends and relatives had been killed.

The general specifications of the bridge are well known. The weight is 70,000 tons; extreme height above river, 350 feet; clearance at high tide, 150 feet; total length of span, 1,800 feet; length of suspended center span, 640 feet; and cost of bridge, $17,000,000. The center span which had been built at Sillery Cove, three miles away, was to be floated on barges to its position and then lifted 150 feet to its final place in the bridge.

Fig. 1 shows the bridge Saturday morning with the hoisting arrangements hanging from the outer ends of the cantilevers. These comprised on each cantilever, a pivoted mooring truss —which appears like a small steel bridge hanging from its end—and four lifting chains made of steel links pierced with holes every six feet. The lifting was to be done by eight hydraulic jacks operated at a pressure of 4,500 pounds.

The bridge is at Neilsonville, about nine miles from Quebec, and Sunday night was spent there to get an early start. All weather signs were anxiously watched because a heavy wind would mean postponement or disarrangement of plans. The bridge company had kept accurate records of weather for five years to assist in making its own forecasts. A storm detector was in use

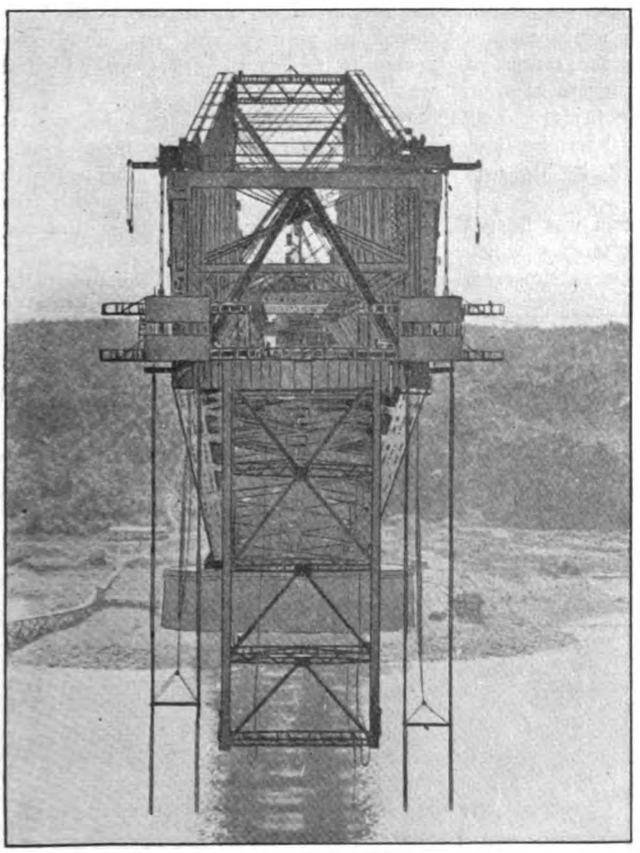


FIG. 2—THE END OF THE SOUTH CANTILEVER PHOTOGRAPHED FROM THE END OF THE NORTH CANTILEVER ON SATURDAY MORNING

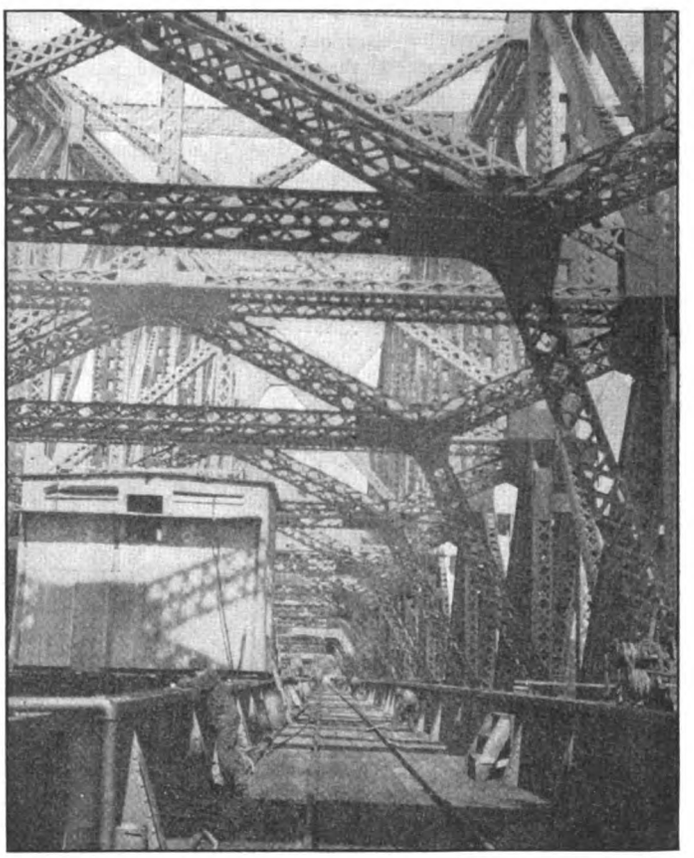


FIG. 3—VIEW FROM THE OUTER END OF NORTH CANTILEVER LOOKING TOWARD SHORE AND SHOWING THE REMARKABLE INTERIOR BRACING

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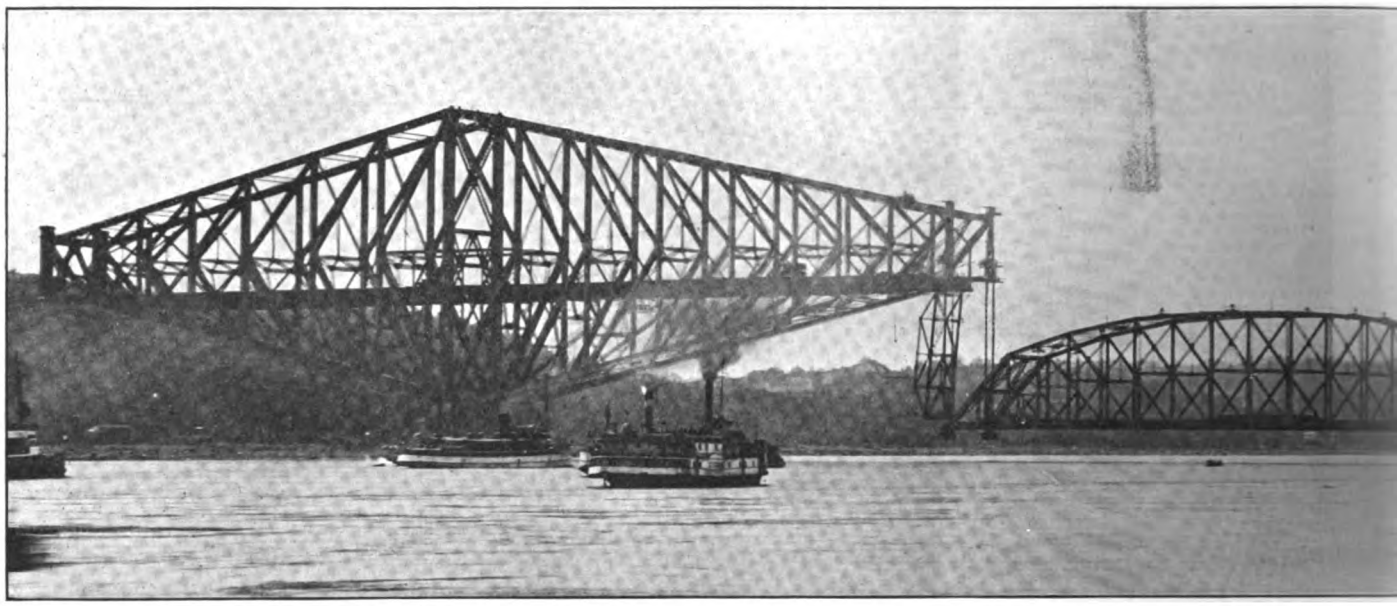

FIG. 4—LIFTING THE SPAN AFTER THE EBBING TIDE HAD TRANSFERRED THE WEIGHT OF THE SPAN FR

which would indicate a thunder storm within 40 or 50 miles. The barometer had not dropped. The only unfavorable indication was a slight east wind and some light clouds which occasionally partly obscured a full moon.

About 1 o'clock Monday morning, at low tide, the valves were closed in the barges which were to bear the center span. As the tide rose the barges floated and at 4 o'clock the span rested on the floating barges. At 5 o'clock eight tugs had pulled the span out into the river to commence its three mile trip up stream. A slight current due to the incoming tide, assisted the tugs.

At the bridge site, the scene was dramatic. The cantilever arms reached out toward each other with their still unspanned gap one-eighth of a mile long. The river surface was brilliantly colored by the rising sun. Occasional banks of mist drifted slowly westward; through one of them the span was emerging with the sun back of it and shining through part of it. A hundred thousand tense spectators watched from boats and the river banks which rose sharply to a height of several hundred feet.

At intervals of 300 feet on each shore, ranges had been located so that the span could be kept parallel to the bridge while nearing its destination. Two balloons hung from wires, marked the line passing through the center of the gap between the cantilevers at right angles to the axis of the bridge. Two trial stops were made to determine how far the span would drift by its own momentum.

About 6:30 a. m. the span was floated to position; the mooring trusses which had been pulled back, were lowered, and in about an hour the attaching of the span to the mooring trusses was completed. The hanger chains were swung to position about 8 a. m. and by 8:30 the pins had been slipped home, connecting the span to the hanger chains.

The first act, considered by many the most hazardous, had been finished with an apparent ease which made it look simple. The great center span, heavy and cumbersome as it was, had been towed to position and was now connected to the cantilevers from which it was designed to hang. The whistles, heretofore solicitously kept quiet not to interfere with the work, now loudly screamed their acclaim; the crowds cheered, and those familiar with the work congratulated each other that the most dangerous job was done.

As yet the barges still supported the

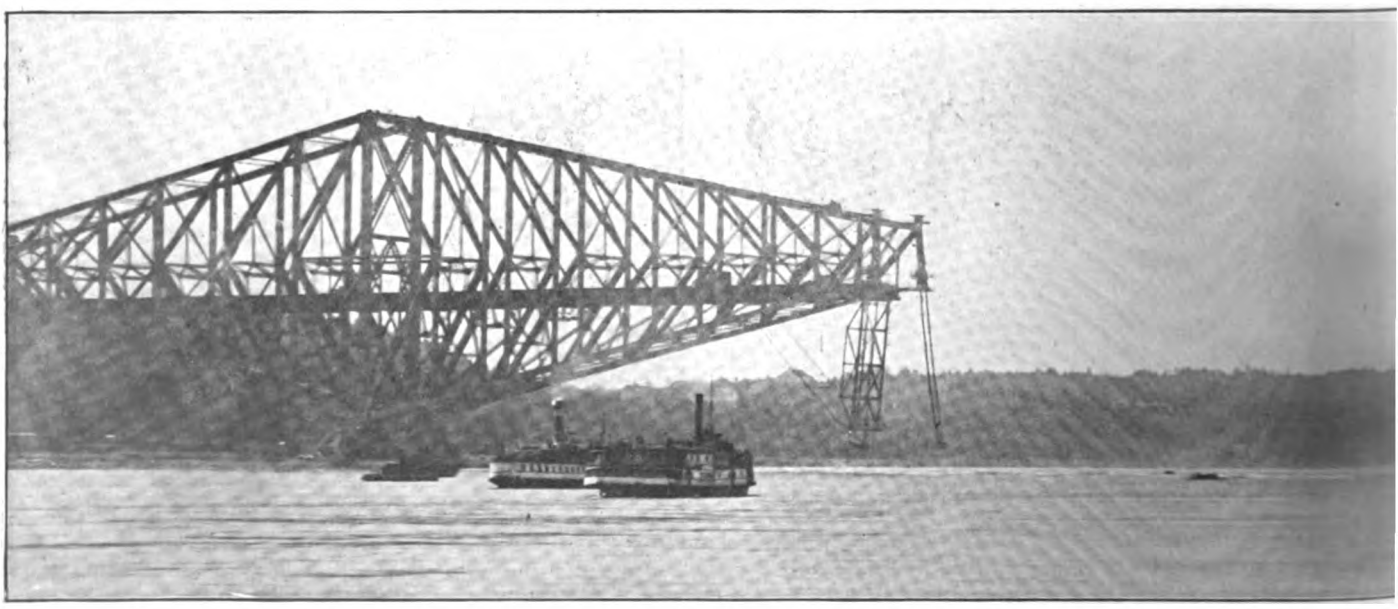

FIG. 5—THE SPAN HAS JUST DISAPPEARED BENEATH THE SURFACE. NOTE THE VIOLENT SWAYING

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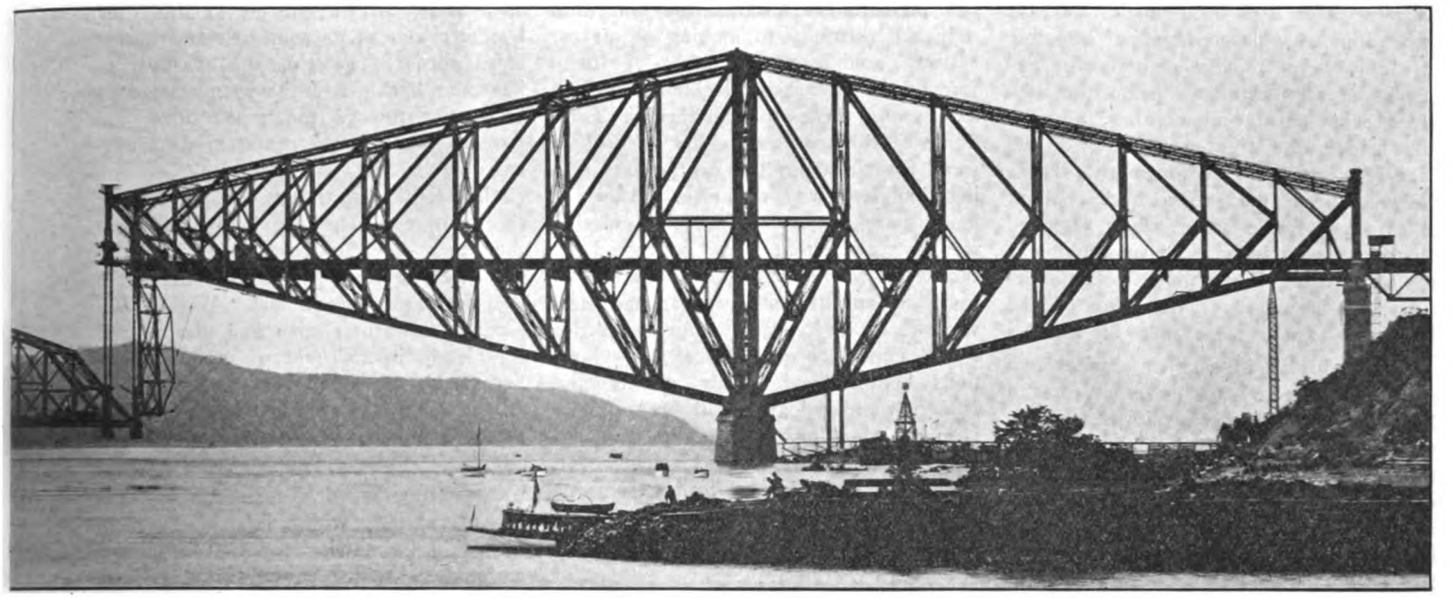
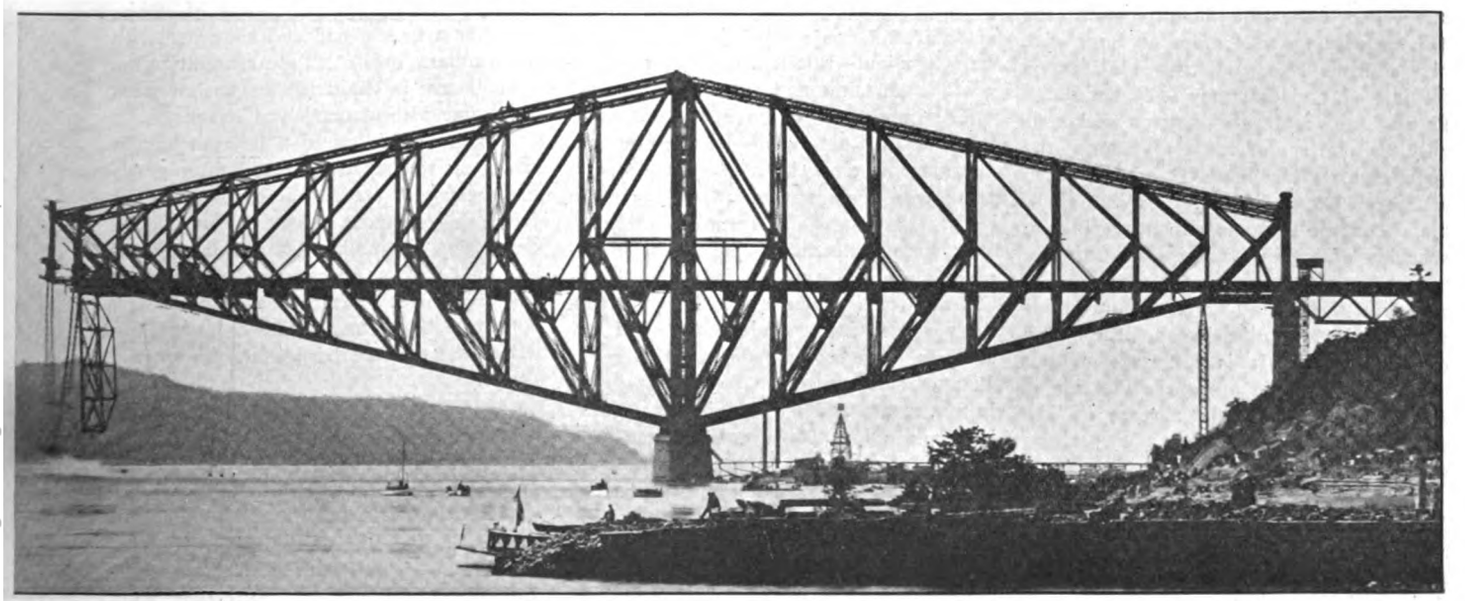


THE BARGES TO THE CANTILEVERS. THIS PICTURE WAS TAKEN A FEW MINUTES BEFORE THE ACCIDENT

span. The tide was commencing to ebb and as it flowed out the barges floated lower and lower, gradually transferring the weight of the span to the cantilevers. This was the test to show if the hoisting equipment and cantilevers would bear the load. No one was permitted on the bridge except workmen and officials of the company and anyone of these who wished to leave was allowed to do so freely. As calculated, the outer end of each cantilever moved 11 inches due to the transfer of weight and the gap between the cantilevers shortened 1 foot. It had been thought that this might be accompanied by noises due to the readjustment of shape, but I was told that those who were at the extreme end, heard absolutely no sounds coming from the structure.

At 9:25 a. m. the span was free of the scows which were quickly towed away revealing the spectacle of the enormous span hanging from the cantilevers with about 15 feet of clearance above the water. The second act had been finished and whistles and cheers showed the crowd's appreciation of the most spectacular part of the operation. A small launch shot under the span, being the first and only boat to pass under the Quebec bridge.

Several lifts were made principally to make sure the hoisting equipment was performing satisfactorily. An hour was then taken for a well-earned breakfast, the engineers and workmen having been up all night. At 10:30 the lifting was resumed and several spectators, including myself, were allowed to go to the outer end of the north cantilever. I had spent all of the previous Saturday morning on the bridge and was fairly familiar with the details of the hoisting arrangements; one was forced to admire their great ingenuity, their obvious power and strength, the precision of the workmanship, and the remarkable precautions taken to avoid accidents. A telephone system was in operation with stations on each cantilever and on the center span 100 feet below. Indicators showed that the jacks were working accurately together and that no jack was higher than the other. As the hydraulic jacks lifted the jacking girders, they were followed up with screw jacks, so that if for any reason the hydraulic jacks failed, the load would be carried by the screw jacks without even the shock due to the span dropping a small distance. Three or four complete rehearsals had previously been made and each man knew precisely the work that he had to do.



THE MOORING TRUSSES, THE HANGER CHAINS, AND THE CABLES HANGING FROM THE CANTILEVERS

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Several lifts had been made and the operation was proceeding as smoothly as if it were a daily occurrence. Remarks were facetiously made that the thing was getting monotonous, and off the bridge, the sight-seeing crowd had largely dispersed. A locomotive crane lowered three men in a bucket about 100 feet to untie some cables attached to the hanger chains. So smoothly was the span being lifted that, in idle curiosity, we leaned over the edge of the bridge to watch these men at work.

About 10:45, in company with two friends, I started to leave. We had been on a temporary platform four or five steps above the bridge floor. One of my companions had already walked down these steps, I was on the steps, and my other companion was still on the platform. Suddenly something happened indicating serious structural failure. There were noises much like a heavy train rushing through a tunnel. I was thrown violently to the floor, fortunately only sustaining a bruised knee. The men in front of me started running as fast as they could toward the shore and I followed as soon as I could regain my feet. The men upon the platform afterwards told me that they had difficulty in moving at all for several seconds and some of them jumped to a nearby locomotive crane and from there to the bridge floor. Some of the workmen either jumped or were thrown from the cantilevers, falling 150 feet into the river. When I had run perhaps 50 feet the swaying was so violent, that I was convinced the cantilever was falling and I planned to jump in an attempt to clear the steel work if I saw it begin to buckle. After I had gone 300 or 400 feet, the vibrations became reassuringly smaller and I then wondered if I had been unduly alarmed, thinking perhaps that one of the locomotive cranes had tipped over. I stopped to look back when someone in the rear yelled to run hard and that the end of the bridge was crumpling. After this warning I did not stop until I reached shore, and it was only then, upon inquiry, that I learned that the center span had fallen into the river.

Gathering together all available evidence, it is probable that the center span fell and broke in the following sequence: First, the southwest corner fell, elevating the northeast corner, the span being carried entirely at this time by the chains at its southeast and northwest corners; second, the west truss began to buckle and the span started to turn over toward the west; third, the span broke from the chains at its southeast corner and fell back again on the chains at the northeast corner; fourth, the span, now buckling badly, fell into the river sidewise and endwise, probably tearing away from the chains at the northeast corner last. Within five seconds the center span had disappeared completely in 250 feet of water. Timbers from the cantilevers and the span floated on the river and boats rushed to rescue men who were struggling to keep afloat.

Something failed despite the wonderful precautions which had been taken. It would be unwise for me to hazard opinions as to the cause of the failure. Many different theories have been advanced and no doubt this point will be settled with convincing certainty by a very careful investigation. A new span will be rebuilt at once, and I have not the slightest doubt that the next and third attempt to span the St. Lawrence river, will be successful.

A Discussion of Anchor Maneuvers

By Capt. Geo. S. Laing

IF YOU are planning to come to a single anchor in a swift tideway where it would be dangerous to swing on a big radius at the change of tide, make sure that you heave short as the water slackens and pay out again when swung. This prevents slack cable from fouling the anchor, and lessens the chance of grounding by the heel. Should a vessel ride widely in a tideway and constantly break her sheer, first, try to tame her with the helm. With the tide velocity up to 4 miles an hour give her a little helm on the side she is fondest of, and that may keep her quiet. If that fails and your stay at anchor is only a matter of a few hours, the quartermaster had better stand his watch and steer her as if under way. Where that is out of the question, heave in two shackles of chain, that is, 30 fathoms, break vessel sheer away from anchor and drop the second hook. Helm amidships again and give her a little scope on this chain. It is not safe to put much rudder angle on where the tide is strong as she will run abreast of her anchor and bring it home or perhaps strain the windlass.

When riding with two head anchors down, the question of turns in the cables has to be considered. The first tide that swings you puts a cross in the chain, and if you keep going in the same direction, full turns will appear. By coaxing with the helm at slack water and getting the vessel to swing in alternate directions a clear hawse may be maintained.

Relieving Twists in Cables

Where one or two turns have unavoidably crept in, hang off the chain you are not riding to with a wire rope or a close lashing round both cables, then unshackle the loose cable and dip it around the other one till a clear hawse is secured. You cannot take a cross or half turn out—just heave in your underneath chain first if in that predicament.

The importance of having an off-shore head anchor out while loading or discharging at a dock in a swift, all-ebb river was demonstrated to the writer a few years ago in Tampico, Mexico. We were unloading coke from Baltimore and had three or four clam-buckets at work, when suddenly the head lines carried away, and in a second our steamer was looking across the river. In a case like this the first thing to do is to run aft and let rip all stern moorings and allow your craft to get in a true line with her anchor. She will break them in any case, but if you are quick enough you at least save one whole set of moorings.

Where vessels have to be shifted short distances in rivers, say up to five miles, it is frequently unsafe to actually sail or steam with head in same direction as the water is running, as your steering is greatly impaired. A good plan is to drift on the ebb or flood, whichever it may be, with the anchor tripping on the bottom, thus proceeding stern first, but being able at any moment to bring her up by the nose. With her head looking towards the oncoming tide you should never lose control. If she makes a feint for either bank of the river, pay out a few fathoms of chain, give her a kick ahead and coax her with the windlass broke till she straightens up. Then heave in chain till the anchor trips and come astern again and so on.

If you are riding to a bow anchor in an open roadstead where lighterage is the means of loading and unloading, it frequently happens that a ground swell or choppy sea endangers the maneuvering of derricks or causes the vessel to roll and carry away the barge moorings. This can be greatly relieved by making a lee side for the barges on the stormy days.

Secure a good hawser on to the bower chain and when the bight is loose in the water, take a good turn to the niggerheads in the forewell deck. If manila rope is used, parcel it with old canvas in the nip of the pipe, if wire rope is used, lubricate with black lead and tallow in the pipe. Now ease your windlass a few fathoms till the bridle

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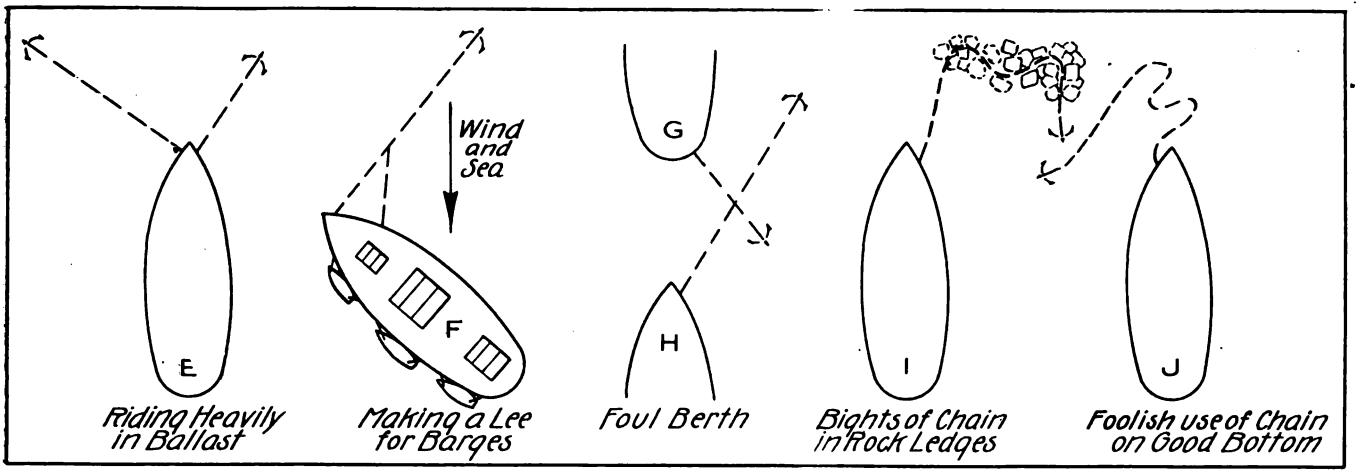

FIG. 1—ANCHOR CHART FOR NAVIGATORS

E—Lightship with chains well spread. *F*—Making a quiet side for barge work. *G* and *H*—Fouled by last arrival. *I* and *J*—It is necessary to see that you actually ride to anchor.

gets a fair share of the riding strain, also aid the vessel to break her sheer with a little angled rudder away from the anchor, and then you have a lee side of about three points or 34 degrees shelter. This worked well in Table bay, South Africa.

The ordinary ways of knowing whether your ship is dragging her ground moorings are very well known and consist of the cross bearing procedure and keeping the lead on the bottom, etc. There are places and times however when these methods are of no use, and we must imagine ourselves riding out a heavy gale, decks awash, vessel rolling heavily, and sea poundage screeching its mad fury from stem to stern. Is she dragging? Through sound and vibration, knowledge of disturbances on the sea bottom are faithfully recorded on deck through the medium of any vessel's ground tackle. Put your hand on the chain. If it feels like any other inert material and emits a slight humming as from telegraph poles, then all is well. She is holding on. This sound is merely caused by the turmoil of spindrift under the hawse pipes.

But should there be the slightest rattle to tingle your senses, especially where the rattle and tingle are not continuous but intermittent, your ship is dragging.

A great object lesson in anchor and chain seismography, that caused the writer to study the phenomenon from a seamanship standpoint, was learned in the anchorage of Carrizal in Chile. We were loading manganese ore in a good sailing clipper and to invite some buoyancy in such a deadweight cargo, a tem-

(*Concluded on page* 405.)

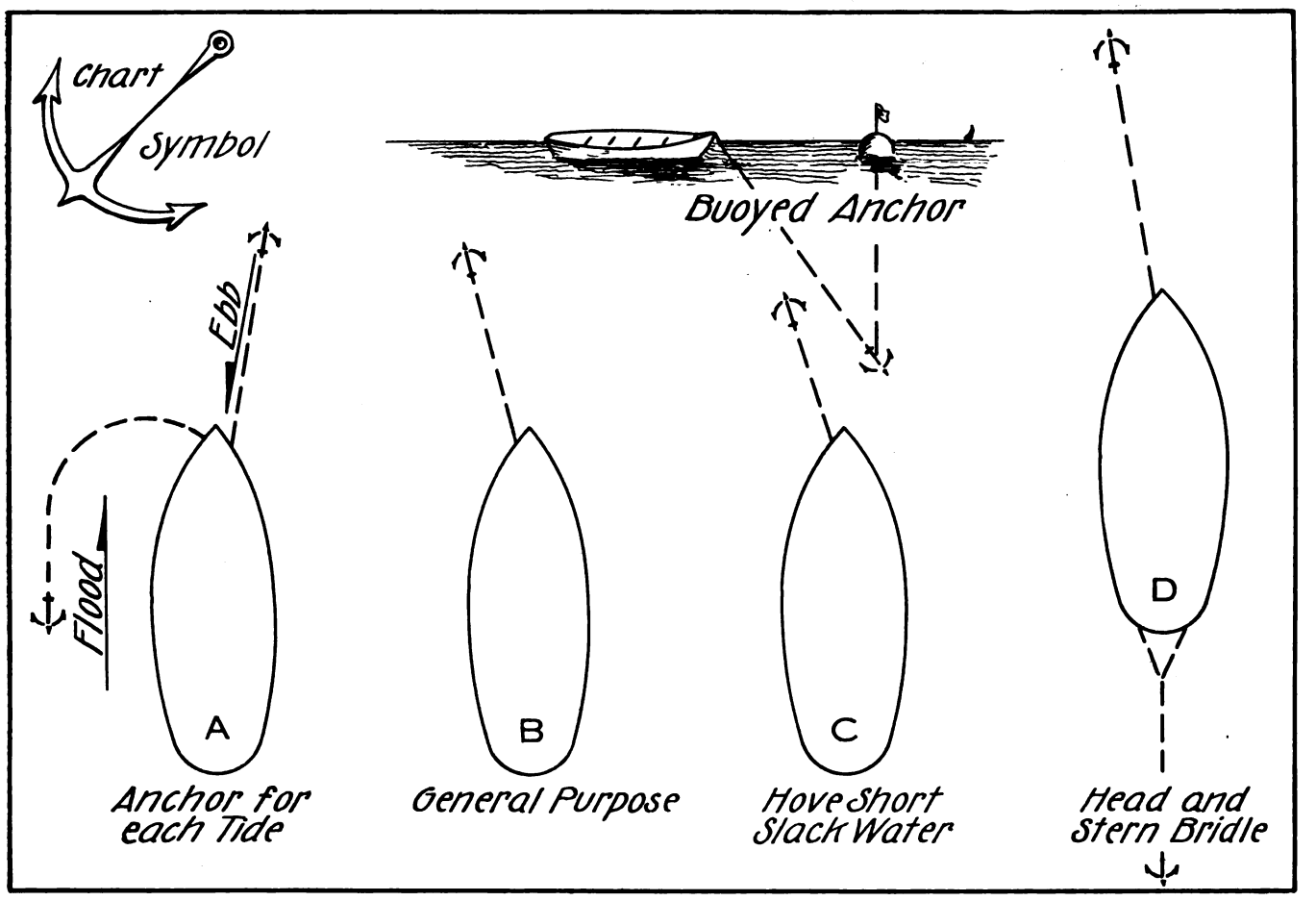

FIG. 2—ANCHOR CHART FOR NAVIGATORS

A—Riding to ebb and flood tides. *B*—Ordinary use of a single hook. *C*—Hove short at a turn of tide if single anchored. *D*—Harbor moorings.

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Latest Marine News in Pictures

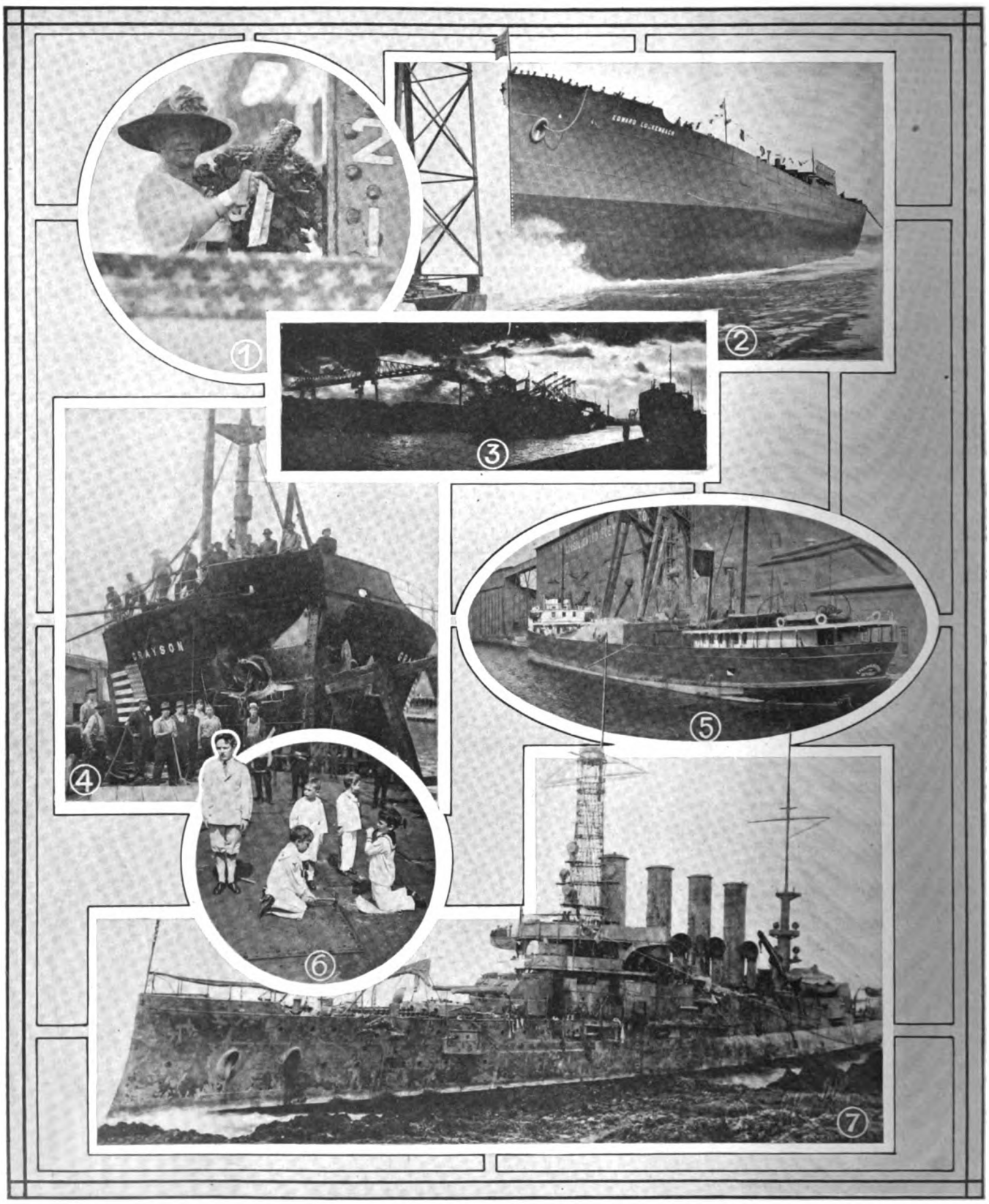

FIG. 1—THE FAIR SPONSOR OF EDWARD LUCKENBACH, ONE OF THE LATEST ADDITIONS TO THE AMERICAN MERCHANT FLEET. FIG. 2—EDWARD LUCKENBACH JUST OFF THE WAYS, QUINCY, MASS. FIG. 3—MOONLIGHT, AFTER A STORM, CONNEAUT HARBOR, ONE OF LAKE ERIE'S LARGEST ORE PORTS. FIG. 4—GRAYSON, BADLY BATTERED AFTER RAMMING THE DUTCH SHIP PARKHAVEN. FIG. 5—AN UNUSUAL DECK CARGO, 300 TONS OF GRAIN FROM THE NORTHERN WHEAT FIELDS ON THE STEAMER LIVINGSTONE, DOCKED IN DULUTH. FIG. 6—DRIVING THE FIRST RIVET IN THE KEEL OF TORPEDO TESTING BARGE NO. 2, CHARLESTOWN NAVY YARD. FIG. 7—ARMORED CRUISER MEMPHIS, FORMERLY TENNESSEE, A TOTAL LOSS ON THE ROCKS OFF SANTO DOMINGO. THE LOSS OF 25 LIVES MAKES THE DUTIES OF PEACE AS GRIM AS THE HORRORS OF WAR

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Photographs From Far and Near

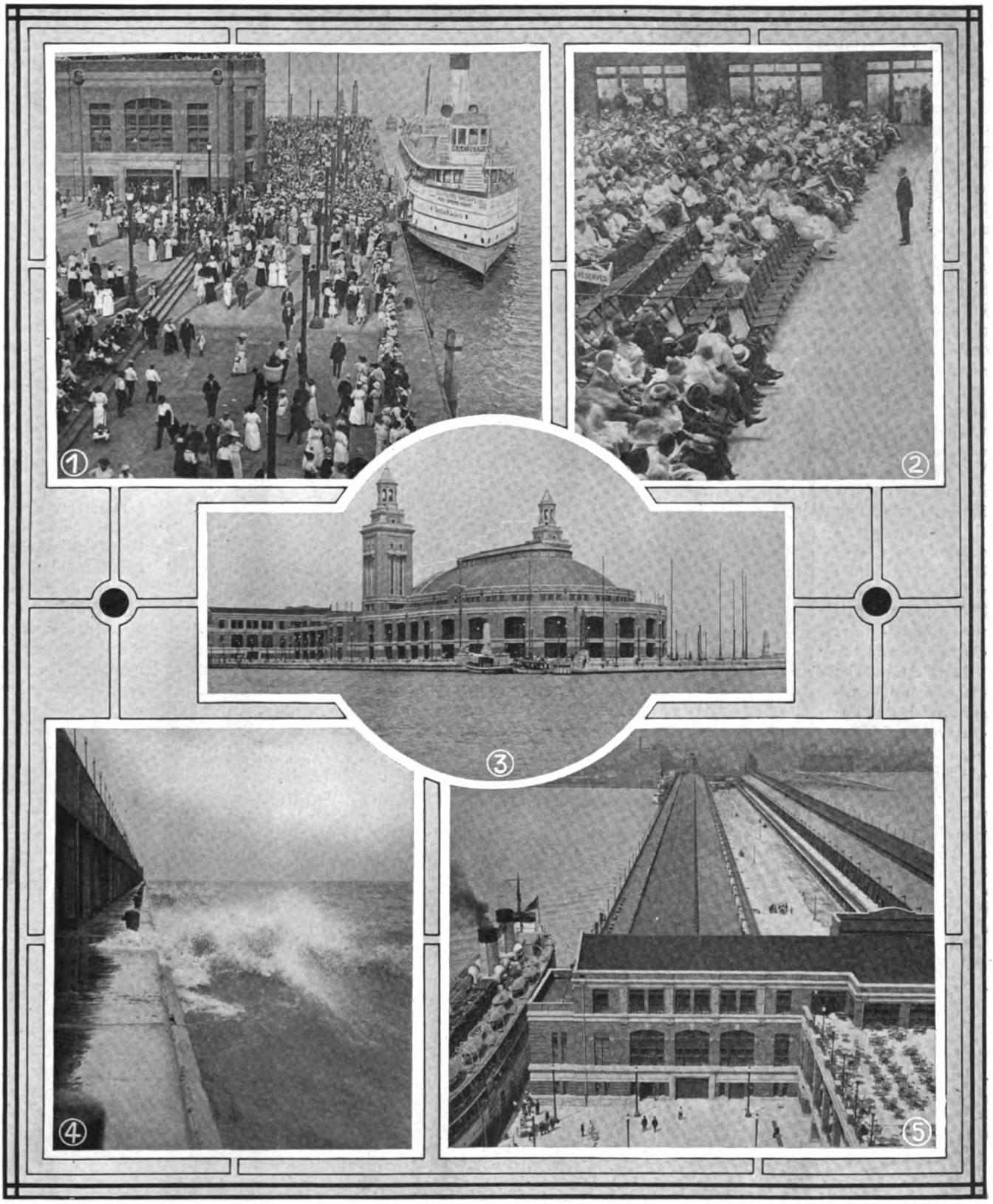

FIG. 1—RELIEF FROM CHICAGO'S SWELTERING HEAT IS MADE POSSIBLE BY SHORT LAKE RIDES TO JACKSON, LINCOLN AND GRANT PARKS. FIG. 2—CHICAGO'S NEW MUNICIPAL PIER INCLUDES A HUGE CONCERT HALL, WHERE SYMPHONY CONCERTS ARE GIVEN DAILY. FIG. 3—END VIEW OF PIER FROM THE LAKE SHOWING BOAT LANDING FOR SMALL CRAFT. FIG. 4—"SMOOTH AS A MILL POND SO MANY DAYS AND THEN SUDDENLY WHIPPED INTO A MAELSTROM OF FURY." FIG. 5—LOOKING TOWARD THE SHORE FROM A TOWER SHOWN IN FIG. 3. PROMENADES, CAR TRACKS AND DRIVEWAYS ARE SHOWN

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J. H. Sheadle, Father of the Savings Plan, Friend of the Sailor

JASPER HOLMES SHEADLE, vice president of the Cleveland-Cliffs Iron Co. and of the Lake Carriers' Association, died Friday morning, Sept. 22, at the Women's and Children's hospital, Syracuse, N. Y. Accompanied by Mrs. Sheadle, Mr. Sheadle had started from Cleveland the preceding Thursday on an automobile trip which was to have taken them to the White mountains. A stop was made to visit friends at Skaneateles, N. Y., where he became ill and was taken to Syracuse. At the hospital, it was found that an operation for intestinal trouble was necessary and it was performed Sunday. The patient grew steadily weaker until the end came. With him in his last illness were Mrs. Sheadle, William G. Mather, president of the Cleveland-Cliffs Iron Co. and A. W. Foote, president of the Foote-Burt Co., Cleveland.

Mr. Sheadle came from Pennsylvania Dutch ancestry and was born 57 years ago at New Bedford, Pa. After completing his education in the public schools and at Hiram college, Ohio, he entered the employ of his father in the banking business at Girard, O., where he remained for two years. He then became connected with the Second National bank of Youngstown, and at the age of 24, was made assistant cashier and served in that capacity several years. He then went to New York and after a year in the service of the Standard Gas Light Co., in that city, returned to Youngstown and became intimately associated with the iron and steel industry as secretary and executive officer of the Mahoning Valley Iron Manufacturers' Association.

In 1890, Mr. Sheadle went to Cleveland, to accept the position of secretary of the Cleveland-Cliffs Iron Co., in which capacity he served until Jan. 1, 1914, when he was elected vice president. He was in charge of the iron ore sales department and in recent years had given his attention largely to welfare work. Mr. Sheadle had been vice president of the Lake Carriers' Association since 1903, and since 1909, chairman of the welfare plan committee. His work in this connection was invaluable to the sailors of the Great Lakes. As a member of the Cleveland chamber of commerce, he rendered important service to his city and he was active as a director in several banks and steamship companies.

Harry Coulby, president of the Pittsburgh Steamship Co., who for many years was intimately associated with Mr. Sheadle, especially in welfare work of the Lake Carriers' Association, says of him:

"In the death of Mr. Sheadle the navigation interests of the Great Lakes have lost one of their ablest men. He had been one of the leaders in the business for nearly 30 years. The work, however, which seemed to particularly appeal to him, and which he loved, was the promotion of the welfare of the sailors. When the welfare committee was appointed a number of years ago, he was selected as its chairman, a position he filled till his death. He was the father of the savings plan and to him alone belongs the credit for originating it and supervising the working out of its details. This plan was eminently successful from the start. In his passing the sailors of the Great Lakes have lost a friend who gave his time and his energies cheerfully always for their betterment. Mr. Sheadle was a high grade man—clean in words and in thought. I have never known a man of higher character."

JASPER HOLMES SHEADLE

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What the Government is Doing

Rulings on Marine Matters **Improvements to Waterways**

Hints to Navigators

Lay Plans for Load Line Regulation

Representative Gathering of Leading American Ship Owners, Builders, Designers and Federal Officials Favors Load Line and Bulkhead Rulings

PRELIMINARY steps looking to load line and bulkhead regulations governing vessels under the American flag were taken at a conference held on Sept. 27 in the office of Secretary of Commerce William C. Redfield at Washington.

With 39 government officials, ship builders, ship owners, architects, marine engineers, underwriters, and others from all sections of the country in attendance it was virtually the unanimous opinion that such regulation is necessary and that it should be adopted as quickly as expediency permits. There was a slight sentiment prevailing that the proposed regulation should be of an international character, and in order to bring this about, if possible, it would be best to wait until after the European war has been concluded. The preponderant opinion, however, was that this plan would be impractical. In the first place, it was pointed out that the duration of the was is extremely uncertain and it would be unwise to delay plans for the proposed regulation. Secondly, it was said by some of the ship owners, such as Robert Dollar, San Francisco, president of the Robert Dollar Co., that it is by no means certain that foreign maritime nations would agree upon international regulation. Reason for doubting that they would do so was expressed by Mr. Dollar, when he said that the United States senate had refused to ratify the London safety-at-sea conference, which incorporated a plan for bulkhead regulation. The best talent of all of the maritime nations, he pointed out, had been represented at that conference, yet in the "great unwisdom of the American congress," he said, it refused to ratify this action. It was also pointed out by Secretary Redfield that some of the belligerent nations are on record as being opposed to entering into such an agreement with their war-time enemies. With others, he conceded that an international system of regulation was the ideal plan, but that it could not be expected to be widely adopted in the near future. The specific action taken by the conference was in line with plans laid at a meeting of the shipping interests in Washington the night before the conference took place. This plan resulted in Secretary Redfield naming a nominating committee of three, which in turn was to appoint a committee of seven, representing all sections of the country, to formulate a general policy with regard to the proposed regulation. The committee of three named by Secretary Redfield consists of Stevenson Taylor, New York, president of the American Society of Naval Architects and Marine Engineers and president of the Amerian Bureau of Shipping; Alfred Gilbert Smith, president of the New York & Cuba Mail Steamship Co., and chairman of the American Committee of Lloyds Register of Shipping, and Homer L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

What the Committee Will Do

The nominating committee was to select the committee of seven as soon as possible in order that it may take up its work without delay. The committee of seven will give thorough study to plans for load line and bulkhead regulation, embracing among other things the systems adopted by European nations, all of which are largely similar in character. The policy of the committee of seven may be outlined in the form of bills or recommendations. One thing thought to be certain is that the committee will ask for the creation by congress of a technical staff which probably would be attached to the bureau of steamboat inspection service of the department of commerce, the bureau administering any laws that might be enacted regarding load lines, bulkheads, etc. This plan would necessarily involve an appropriation. It is the same plan that other nations have adopted.

The committee of seven will make its report and any recommendations it may see fit to offer to Secretary Redfield. Mr. Redfield probably will lay the report before the shipping board for its approval or disapproval. Inasmuch as it will be an administrative matter, however, the bureau of steamboat inspection service is expected to have direct charge of enforcing the regulations.

Expressions as to the proposed regulations were offered by nearly all of those present. Their general trend was that the regulations will follow closely the line of those of other countries, particularly with regard to load line regulations as outlined in the report recently made by a committee for Great Britain. This committee began work in 1913 and its research was exhaustive, entailing a cost of $250,000.

The selection of the nominating committee met with the hearty approval of the conference because of the able character of its personnel. Mr. Smith and Mr. Ferguson were two of the American delegates to the London conference in 1913-14 and members of the committee on construction of ships. Their work at the conference dealt with the question of load line and bulkhead regulation, as well as with other extremely important problems. Mr. Taylor is well known in American maritime circles as an able and practical architect and engineer and one who has given a searching study to the technical questions involved in ship construction.

It was recognized at the conference that the matter of load line and bulkhead regulation involved many difficulties, and that it would require the best talent in the country to overcome them. Yet it was also realized that such regulation was necessary and could be worked out satisfactorily. The committee of seven which will take up this important task was to be chosen from the ranks of ship builders, ship owners, architects, and engineers and perhaps underwriters. No government official will be named on the committee, at the request of Secretary Redfield, who assured the conference that the department would be ready and anxious

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to co-operate with the committee at any time.

In his opening remarks, Secretary Redfield said it was intolerable that America is the only maritime nation without load line or bulkhead regulations. He said he desired that such regulations be adopted as soon as they could be determined upon after due study. He expressed particularly anxiety that such regulation be made so as to assure more safety at sea and on the Great Lakes. He spoke especially of the hazards on the Great Lakes and said he would like to avoid them as much as possible this winter. There is a temptation to overload on the Great Lakes, he stated, which the department was unable to prevent. He asserted that he proposed that ship builders, ship owners, and others should share with the department the responsibility for loss of life. It was stated also by Mr. Redfield that the department had arranged to put two inspectors at each of two lake ports and one at a port between them to watch the matter of overloading. The public, he said, will no longer tolerate overloading. Suggestions made at the conference will also be placed by him before the President and congress.

Mr. Redfield asserted that the department had no program to impose, but that it was seeking the advice of the best talent of the country. The many difficulties of load line and bulkhead regulations, he assured the conference, were appreciated by the department.

Shippers Favor Regulation

Stevenson Taylor, speaking for the shipping interests, told Mr. Redfield that they were in cordial sympathy with his plans and concurred in them. The large representation at the meeting, coming from all sections of the country, he said, was evidence that the shipping interests were desirous of aiding the department and that they recognized the necessity of proper load line and bulkhead regulation. He said that it involved many technical difficulties and that extreme care should be taken so that American vessels would not be placed at a disadvantage in this respect in competition with foreign ships. D. T. Warden, marine superintendent of the Standard Oil Co. of New Jersey, expressing his sympathy with the plans, said he thought modern vessels are built with full consideration as to bulkheads and load lines. Mr. Dollar, who also said that load line and bulkhead regulations should be adopted, pointed out, however, that such regulations should be consistent with those of other countries. It was necessary, he insisted, that the American vessels should not be further handicapped. At the same time, he added, American ship owners do not ask one-half inch more space to load than is allowed owners of foreign vessels. Competition in shipping after the war, according to Mr. Dollar, will be the most severe in the history of the world, and it is vitally necessary that no undue restrictions be placed on American ship owners. He said that if congress will leave them alone, they will work out a way in spite of any competition, and concluded by again expressing the hope that load line and bulkhead regulations would be adopted and would follow the lines of those of other nations. Similar expressions were made by others at the meeting.

Those present were:

A. L. Thurman, solicitor, department of commerce.
Eugene T. Chamberlain, commissioner of navigation, department of commerce.
George Uhler, supervising inspector general, steamboat - inspection service, department of commerce.
W. A. Dobson, Philadelphia.
E. C. Bennett, Fore River Ship Building Corporation, Quincy, Mass.
Hardon Chubb, American Institute of Marine Underwriters.
D. T. Warden, Standard Oil Co. of New Jersey, New York City.
A. J. Plummert, Standard Transportation Co., New York City.
F. M. Cornbrooks, Bethlehem Steel Co., Sparrows Point, Md.
George Stewart, P. & R. Transportation Line, Philadelphia.
A. M. Main, Harlan & Hollingsworth Corporation, Wilmington, Del.
Robert Dollar, San Francisco, Cal.
D. Mathieson, naval architect and marine superintendent, W. R. Grace & Co., New York City.
Ernest F. Rue, Vacuum Oil Co., New York City.
Henry P. Imhu, Chamber of Commerce of the United States.
C. H. Peabody, Massachusetts Institute of Technology.
E. H. Duff, American Steamship Association.
F. A. Hunnewell, constructor, United States coast guard, Washington.
A. F. Pillsbury, ship owners of the Pacific coast, San Francisco, Cal.
W. T. Tibbitts, Shipowners' Association.
R. W. Myers, shipowners of the Pacific coast, San Francisco, Cal.
Alfred Gilbert Smith, New York City.
D. W. Taylor, chief constructor, United States navy.
Frank Van Vleck, marine engineer and naval architect, war department.
W. L. Capps, chief constructor, United States navy.
Herbert C. Sadler.
Charles C. West, Manitowoc, Wis.
F. Ridgway, International Mercantile Marine, New York City.
A. C. Besselievre, Pennsylvania Ship Building Co., Gloucester, N. J.
J. A. Edes, Bethlehem Steel Co., Sparrows Point, Md.
George C. Shepard, Baltimore.
J. W. Powell, president, Fore River Ship Building Corporation, Quincy, Mass.
James French, chief surveyor, Lloyds Registry of Shipping, New York City.
Ernest H. Rigg, naval architect, New York Ship Building Co., Camden, N. J.
Maurice Bouvier, vice president, W. R. Grace & Co., New York City.
Franklin D. Mooney, president, New York & Porto Rico Steamship Co., New York City.
C. D. Mallory, vice president, Clyde & Mallory Steamship Co., New York City.
Harvey D. Goulder, general counsel, Lake Carriers Association, Cleveland.

Load Line Committee

The committee which will investigate the subject of load line and bulkhead regulation along the lines indicated in the accompanying article has just been named. The members are: Stevenson Taylor, New York, president of the American Bureau of Shipping and of the American Society of Naval Architects and Marine Engineers; H. C. Sadler, Ann Arbor, Mich., professor of naval architecture, University of Michigan; H. N. Herriman, Cleveland; C. J. Olson, San Francisco; H. H. Raymond, New York, manager Clyde Steamship Co., and Mallory Steamship Co.; T. M. Cornbrooks, Sparrows Point, Md., chief engineer and naval architect, Bethlehem Steel Co.'s Maryland ship building plant; William Gatewood, Newport News, Va., naval architect, Newport News Shipbuilding & Dry Dock Co.; W. A. Dobson, Philadelphia, naval architect, Wm. Cramp & Sons Ship & Engine Building Co., and J. W. Powell, Quincy, Mass., president Fore River Shipbuilding Corporation.

The date and place of the first meeting of the committee will be arranged by Mr. Taylor.

The committee was named by Secretary Redfield on the recommendation of the nominating committee.

Fire Resisting Material

The bureau of standards, department of commerce, in connection with a general study of fire-resisting materials, is considering among other phases of the subject the development of a fire-resisting material for use in constructing, in whole or part, the deck structures of excursion and passenger steamers. So far as may be applicable, the material when developed would also be considered in relation with other marine uses.

The bureau of standards would be glad to receive from manufacturers samples of such materials as they consider suitable for the purpose, in order that they may be given consideration.

New Alaska Light Station

Cape St. Elias light station, Alaska, has been placed in commission and the temporary light discontinued. This station is located on the south end of Kayak island, on a shelf about 45 feet above sea level. The tower is square and supports a cast-iron watch room and second-order lantern, whose focal plane is 40 feet above the base of the structure and 85 feet above sea level. The tower rises above the roof of the fog-signal building from one of its ends. On a terrace east and north of this building are located the cooling tanks for the engines, the fuel-oil and illuminating-oil tanks, cisterns, the

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dwelling with quarters for three keepers (men only), and the boat and hoisting-engine house, with an inclined railway to the sea level. There is a system of roads, tracks, sewers, drains, etc., about the buildings, which are of reinforced concrete and hollow terra-cotta tile where the latter is practicable. The illuminating apparatus consists of a three-mantle lamp in a third-order, double-flashing lens of 300,000 candlepower, and the range due to its elevation is 15¼ nautical miles. The metal superstructure of the tower, including the watch room, gallery, and helical bar second-order lantern, was on exhibition at the Panama-Pacific international exposition in San Francisco during 1915. The fog signal, which will be placed in commission at an early date, consists of a 6-inch automatic compressed air siren, in duplicate, each with a trumpet with a two-way mouth. This machinery, including the necessary air tanks and piping, was also exhibited at San Francisco.

The characteristic of the light is a double white flash every 20 seconds. That of the fog signal will be a double blast of 4 seconds each every minute.

This lighthouse will be one of the most important on the coast of Alaska, as it is the landfall light for vessels bound to Prince William sound or Cook inlet from either the Pacific coast of the United States or southeastern Alaska. It has been constructed by the lighthouse service directly, which has maintained a force during the past two seasons at this remote spot.

A gas, whistling and submarine bell buoy was placed off this cape on May 14, 1916, and an automatic gas light has also been maintained on an offlying rock during the construction of the lighthouse.

New Dry Docks at Panama

THE virtual completion of the 1,000-foot dry dock at Balboa, together with the shops and foundries there, and of the 485,000-ton coaling plant at Cristobal, is an important step in the militarization of the canal and making it an important naval base. The dry dock and the coaling plant are now in operation, although further work is necessary to bring them to completion.

The dry dock is 1,000 feet long by 110 feet wide, having the same dimensions as the chambers of the locks. It will accommodate the largest ships in the world, and even at this stage of completion has handled one vessel drawing 33 feet of water. It has a depth over the blocks of 35 feet at mean tide, or 45 feet at high tide. It is an integral part of the terminal shops and foundries. Together they can do practically any sort of ship repair work.

The new coaling plant at Cristobal, which has an emergency storage capacity of nearly 500,000 tons, which may be increased indefinitely in connection with land storage alongside the plant, has been designed with especial regard to naval uses. Its ability to deliver 2,000 tons of coal an hour to a ship will make it theoretically possible for a whole fleet to coal there in 24 hours for an extensive cruise. The plant is of a novel design, made with a view to just such an emergency.

The first use of the new dry dock was made on June 27, with the docking of the dredge COROZAL, and since that time other canal vessels have been docked. The first privately owned vessel to make use of it was the 81-ton auxiliary schooner CHIRIQUI, registered in Panama, which entered the dock a few weeks ago.

On Aug. 25 the steamship STRATHEARN, bound from Pensecola for Pisagua, went into the dock to have her bottom cleaned and painted, the rudder unshipped and fitted with new pins and bushings, and general repairs made. STRATHEARN is 370 feet in length by 52 feet beam, but as she was in ballast was drawing only 15 feet of water. She came out on Aug. 28.

The steamship LAUTARO, which suffered damage to the hull by striking a rock in Cucaracha slide in Gaillard cut, went into dock in the afternoon of Tuesday, Aug. 29, after most of her cargo had been unloaded at Balboa. LAUTARO is 344 feet in length by 44 feet 6 inches beam; she drew 24 feet at the time of her accident and 18 feet when she entered the dry dock. One of the dredging division's 1,000-yard barges was docked with LAUTARO.

The cruiser CHARLESTON, which has been stationed at the Atlantic entrance to the canal, was docked as soon as the work on LAUTARO had been finished.

The total number of seamen shipped and reshipped on American ocean vessels (counting repeated shipments) by United States shipping commissioners during the fiscal year ended June 30, 1916, was 252,681. Of these 76,956 were born Americans, 31,877 naturalized Americans, 33,139 Spaniards, 29,523 British, 25,194 Scandinavians, 12,415 Germans, 7,949 Russians, and the remainder of all other nationalities. Americans thus comprised 43 per cent of the total, compared with 47 per cent in 1914 before the war.

200-Year Old Light

A small bronze tablet, bearing the inscription "Boston Light, built at this place by the Province of Massachusetts, was first lighted September 14, 1716, Old Style, destroyed 1776 and rebuilt 1783", and in small letters beneath, "This tablet has been placed by the United States Lighthouse Service, September 25, 1916, in commemoration of the two hundredth anniversary of the first lighthouse in America", was unveiled Sept. 25 with appropriate ceremonies at Boston light station, at the entrance to Boston harbor, Mass.

Boston light has had an eventful and interesting history during its 200 years of existence. First built by the province of Massachusetts at a cost of $11,500, it was captured and recaptured several times in the early days of the Revolution, and finally demolished by the British in 1776 at the time of the evacuation of Boston. It was rebuilt on the same site in 1783 immediately after the close of the war, and with eight other colonial lights then in operation was taken over by the general government in accordance with the act of congress of Aug. 7, 1789. The height of the tower was increased in 1859. The buildings have been renovated and the apparatus and equipment improved from time to time as needed, so that despite its age, the light station is for all practical purposes essentially modern. It displays an incandescent oil-vapor light giving a white flash of 100,000 candlepower every 30 seconds, visible 16 miles in clear weather, and as an auxiliary aid in foggy weather, sounds a powerful first class steam siren, with a double blast of five seconds each every minute.

September Lake Levels

The United States lake survey reports the stages of the Great Lakes for the month of September, 1916, as follows:

Lakes.	Ft. above mean sea level.
Superior	603.88
Michigan-Huron	580.76
Erie	572.33
Ontario	246.69

Lake Superior is 0.15 foot higher than last month, 1.48 feet higher than a year ago, 1.27 feet above the average stage of September of the last 10 years, 0.20 foot below the high stage of September, 1869, and 2.39 feet above the low stage of September, 1875. During the last 10 years the September level has averaged about the same as the August and October levels.

Lakes Michigan-Huron are 0.28 foot lower than last month, 0.82 foot higher than a year ago, 0.10 foot above the

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average stage of September of the last 10 years, 2.67 feet below the high stage of September, 1876, and 1.10 feet above the low stage of September, 1911. During the last 10 years the September level has averaged 0.2 foot lower than the August level and 0.2 foot higher than the October level.

Lake Erie is 0.47 foot lower than last month, 0.13 foot higher than a year ago, 0.02 foot below the average stage of September of the last 10 years, 1.61 feet below the high stage of September, 1876, and 1.05 feet above the low stage of September, 1895. During the last 10 years the September level has averaged 0.3 foot lower than the August level and 0.2 foot higher than the October level.

Lake Ontario is 0.67 foot lower than last month, 1.24 foot higher than a year ago, 0.59 foot above the average stage of September of the last 10 years, 0.92 foot below the high stage of September, 1862, and 2.69 feet above the low stage of September, 1895. During the last 10 years the September level has averaged 0.4 foot lower than the August level and 0.4 foot higher than the October level.

The End of "Empress of Fort William"

CAPT. SHEPHERD, late of EMPRESS OF MIDLAND and TACONA, has been appointed master of the S. S. FORDONIAN, which is in the service of the Quebec Steamship Co., on the run between New York and the West Indies. Capt. Shepherd was recently presented with a gold watch for attempting to go to the rescue of the crew of the S. S. MALOGA, when that vessel was sunk in the English Channel. In the attempt Capt. Shepherd himself suffered shipwreck, his vessel, EMPRESS OF FORT WILLIAM, striking a mine and sinking almost immediately.

Capt. Shepherd told the story of how he was wrecked in a recent issue of *By-Water Magazine*. "It was at South Shields," he said, "that we loaded what was the last cargo for EMPRESS OF FORT WILLIAM, and sailed on the afternoon of Feb. 25, 1916. We left the Tyne during a southeast gale, with bad weather all the way. We made the Downs about 9 a. m. on Feb. 27, 1916, where some 200 ships were anchored (what a target for a British submarine were the position reversed). Dodging, without anchoring, until we got our clearance, we were off in the van of the ships going south. But there were faster ships than us, and among them was the large P. & O. liner, MALOJA, pronounced 'Maloya,' which passed us, just after we had passed the South Goodwin lightship. We admired the ship as she passed, but felt no envy of the officers in charge.

"I asked my first officer, Mr. Bray, how he would like to be on her, and bound to India. His reply was, he would rather be where he was. I think, at that time we both felt we would rather be in the thick of things. She passed us close to, going double our speed, and soon drew well ahead until she was perhaps about three miles from us. As I did not continue to watch her, I did not see what happened, but soon I noticed that she seemed to be in trouble, owing to the way she was heading, as she was well off the course she should be steering.

"I called Mr. Bray's attention to her, but bless him, he is not the man to see trouble if he can help it, and he gave as his opinion that she was all right. It was soon only too evident, however, that MALOJA was sinking; and acting on my order, Mr. Bray sprang aft, in a way that would give many a younger man a lead, to tell Mr. Udall, the chief engineer, to give FORT WILLIAM all he knew.

A Good British Sailor

"As he did so, I turned to the man at the wheel—'a bad young boy,' the parsons might call him, but a good British sailor—and said, 'You don't mind taking a chance, Orr?' Promptly his reply came back: 'She's steady on the P. & O. boat, Sir. If we pick up one we'll do something.'

"To the second engineer, Mr. Jenkins, who happened to be on deck, I shouted, 'Get all your men up, boat station,' and although he sometimes calls them 'ginks,' when he is annoyed, they certainly jumped for him that day. Then the mate, when he came forward was told the same, and Mr. Halifax, although off watch and asleep, after keeping eight hours the previous night, must have dreamed the order, as it was only seconds until he was at his boat half dressed. Not one man aboard asked 'why?' All jumped—and jumped quickly.

"Then we got it! I was looking aft at the time, to see that all were at the boats, when suddenly there was a most violent explosion; as I write I can hear it, with a rending, tearing sound, followed by the hatch coverings off No. 7 hatch being thrown, in a dense cloud of coal well over the masthead.

"Then, stillness; and when the dust had cleared, I was astonished to see my men working away clearing the boats as if nothing had happened, or so it looked from where I was standing.

"The rate at which the stern sank made it only too evident that EMPRESS OF FORT WILLIAM had got her deathblow, and I think our first feeling was one of sadness that such a harmless but useful ship should be sunk in such a way, without warning of any sort.

"Next came the feeling of self-preservation, and we were not sorry to see one of our torpedo boat destroyers making for us at something under 40 knots an hour. After the first excitement, during which there were some rather amusing incidents, no member of the crew showed any undue haste to leave the ship, and all obeyed orders implicitly, with the exception of the first engineer, who had to be told more than once to come out of the engine room.

"However, most of us got away in our starboard lifeboat, while the remainder were taken off by a boat from the destroyer. On board the destroyer we were well cared for, warmed up in defiance of the King's regulations, and given opportunity to dry our rags. We were soon landed at Dover, and a cherrier or better behaved shipwrecked crew never landed anywhere, and not one of them ever gave any trouble, not even old John Murray, the donkeyman. Now they have gone their different ways, all have sailed again, and some have been shipwrecked again but none is downhearted."

Amazon Boat Makes Trip to Pacific

A few weeks ago the steamer YURIMAGUAS arrived in Callao, Peru, from Iquitos, Peru, having the distinction of being the first merchant ship to make the trip from the latter port, on the headwaters of the Amazon river in eastern Peru, down the Amazon river, across the Atlantic, through the Caribbean sea and the Panama canal, and down the west coast of South America. YURIMAGUAS, which is a river boat, 141 feet in length, with a speed of 10 knots, made the trip in 67 days. By land the two cities are only 800 miles apart. The vessel's owner, Don Luis Felipe Morey, who is a wealthy rubber planter, states that it is his intention to establish a regular line of steamers between Iquitos and Callao.

Gallagher & Asher, 112 West Adams street, Chicago, have been appointed western representatives of the Oriental Navigation Co.

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In the Traffic Manager's Office

A Review of the Month on Coasts and Lakes—Useful Pointers for the Men Who Get the Business

End of War Will Start New Trade Battle

VIGOROUS preparations for the "war after the war" are being made by shipping interests of both the central European and allied groups of nations. Whether this post bellum war will be waged between two hostile commercial groups or will be merely a keen economic battle along recognized lines of commerce, is impossible to foretell. Representative opinion in England seems to be divided upon the question of whether an economic war between closely allied trade groups would be sensible or suicidal. From Germany, Herr Heineken, director of the great North German Lloyd line, scouts the probability of such a war and ridicules the possibility of its success.

Regardless of what the future may disclose, however, the big shipping companies on both sides are busily preparing themselves for the battle for the world's trade. Herr Heineken points out that at the close of the war the North German Lloyd will unleash a bigger and better fleet than it had when the war opened. While merchant vessel construction by both groups has been hampered by the war, signs continue to multiply that this condition is being rectified and that ship builders are being permitted to bend their energies to the construction of new merchant ships.

* * *

THE surface indications of Great Britain's preparation for carrying the post bellum trade are seen in the policy of consolidation now in such high favor there. As outlined in *The Marine Review* last month, British hopes of continued maritime supremacy rest on a "careful co-ordination of plans and effective co-operation between ship owners." Hints of how far it was thought necessary to carry out this co-operation were gained a few weeks ago when the Cunard line took over several smaller companies and laid the basis for an "all-red route around the world."

Closely following this consolidation, come announcements that Furness, Withy & Co. will take over the Prince line; that the Peninsular & Oriental Steam Navigation Co. will absorb the New Zealand Shipping Co.; that the London & Northern Steamship Co. has changed hands; that the Australian government has purchased 15 ships; that the Taylor & Sanderson Steam Shipping Co. will probably change ownership.

* * *

MATCHING these plans are recent announcements of expansion by French, Belgian, Japanese and Norwegian lines, and what is of more interest, that American capital is backing new lines from American ports. Representative ship owners all over the world are staking their fortunes and reputations on the assumption that post bellum competition on the seas will be keener than was ever witnessed in the past. And in preparing for this competition they are building up their companies to a position far stronger than they held in the period before the war.

* * *

AN announcement of the merger of the Prince line with Furness, Withy & Co., Ltd., is expected at any time. Reports from London concerning the merger have indicated definitely that the Furness-Withy interests have acquired control.

Such a consolidation, it will be noted, would be in general line with the tendency that has lately developed in British shipping. This trend, as explained, is the result of war earnings on the part of many of the larger companies and a realization of the desirability of presenting a united front in the competition that will follow the war.

The Prince line is considered by shipping men to be more important than any property that has come under the control of the Furness-Withy interests. While the number of vessels is less than that owned by Furness, Withy & Co., directly, the tonnage is greater than that of this fleet. Other companies controlled by Furness, Withy & Co. are the following, the number of vessels owned by each being indicated:

The Argentine Cargo Line, Ltd., two ships.

The British & Argentine Steam Navigation Co., Ltd., four ships.

Empire Transport Co., Ltd., 18 ships.

Naamlooze Venn. Furness' Scheepvaarten Agenthur-Maatschappij, seven ships.

The British Empire Steam Navigation Co., Ltd., nine ships.

British & Irish Steam Packet Co., Ltd., seven ships.

Furness-Houlder Argentine Lines, Ltd., three ships; four ships building.

Gulf Line, Ltd., eight ships; two ships building.

Hessler Shipping Co., Ltd., one ship.

Houlder Line, Ltd., 12 ships; one ship building.

Johnston Line, Ltd., 15 ships.

London Welsh Steamship Co., Ltd., two ships.

Neptune Steam Navigation Co., Ltd., 11 ships.

Norfolk & North American Steamship Co., Ltd., nine ships.

H. L. Stocks & Co., Ltd., two ships.

Geo. V. Turnbull & Co., Ltd., one ship.

White Diamond Steamship Co., Ltd., three ships.

Of the vessels owned by subsidiary companies, 32 are of more than 5,000 gross tons. The acquisition of the Prince line fleet, numbering 38 vessels, would bring the total of ships owned by, or building for Furness, Withy & Co. or its subsidiaries, to 199 vessels, plying in trades all over the world. The regular services of the Prince line are between New York and South African ports, between New York and the Far East, between New York, London and Antwerp and the River Plate, between the United Kingdom and the continent and New Orleans, between Brazil and New York and the River Plate, and between British and Mediterranean ports.

The vessels of the Prince line, as listed in Lloyds Register of Shipping, 1916-17, are as follows:

Name—	Built.	Gross tons.
Afghan Prince	1903	4,923
African Prince	1903	4,916
Asiatic Prince	1910	2,887
Belgian Prince	1901	4,765
Black Prince	1903	3,925
Burmese Prince	1911	4,825
Carib Prince	1893	1,975
Chinese Prince	1911	4,834
Corsican Prince	1900	2,776
Creole Prince	1893	1,988
Eastern Prince	1910	2,885
Egyptian Prince	1902	3,117
French Prince	1900	4,766
Georgian Prince	1893	3,245
Highland Prince	1901	3,390

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Italian Prince	1893	3,083
Japanese Prince	1911	4,876
Kaffir Prince	1891	2,228
Merchant Prince	1902	3,092
Mexican Prince	1893	3,028
Moorish Prince	1914	5,943
Norman Prince	1900	3,464
Ocean Prince	1907	5,101
Portuguese Prince	1912	4,981
Roman Prince	1914	5,284
Roumanian Prince	1913	4,147
Royal Prince	1907	5,547
Russian Prince	1912	4,158
Scottish Prince	1910	2,897
Servian Prince	1901	4,831
Siamese Prince	1911	4,847
Soldier Prince	1901	3,118
Stuart Prince	1899	3,597
Swedish Prince	1896	3,712
Trojan Prince	1896	3,196
Tudor Prince	1903	4,292
Tuscan Prince	1913	5,275
Welsh Prince	1903	4,934

The following are the ships belonging to Furness, Withy & Co., Ltd., as shown by Lloyds Register for 1916-17:

Name—	Built.	Gross tons.
Annapolis	1911	4,567
Bedale	1914	2,107
Boliviana	1900	4,573
Castle Eden	1914	1,949
Charleston	1908	1,866
Collingwood	1905	1,278
Croxdale	1906	1,295
Cundall	1908	1,851
Digby	1913	3,966
Durango	1895	3,008
Eavestone	1912	1,858
Egyptiana	1905	3,818
Easton	Building	5,300
Fernandina	1908	1,851
Graciana	1903	3,536
Grantley	1908	1,869
Hochelaga	1912	4,681
Indiana	1902	3,869
Kanawha	1893	3,884
Lexington	1906	3,974
Lingan	1911	1,301
Maxton	1912	3,840
Norton	1907	1,825
Pensacola	1914	2,092
Pomaron	1907	1,809
Portinglis	1908	1,867
Rapidan	1907	3,760
Rappahannock	1893	3,871
Roanoke	1907	3,765
Rouen	1909	1,968
Ryhope	1907	1,334
Tobasco	1895	2,987
Tamaqua	1910	5,191
Thornby	1907	1,327
Venice	1914	1,874
Waterland	1902	494
Westward	1907	1,968
Whorlton	1907	1,469
Wyncote	1907	4,937
Wingate	1914	1,911

* * *

OFFICIAL details of the plan under which the Peninsular & Oriental Steam Navigation Co., London, will absorb the New Zealand Shipping Co., are now available. It is proposed to increase the capital of the P. & O. company from £1,798,133 deferred stock to £2,704,853 deferred stock, thus making, with the addition of the existing preferred stock, a total capital of £5,744,853. The agreement provides that each ordinary share of £10 fully paid of the New Zealand Shipping Co., Ltd., shall be exchanged for £10 of fully paid P. & O. deferred stock the total issue of P. & O. deferred stock to effect this arrangement, and for which power is asked, being £906,720.

For a number of years past the British India Steam Navigation Co., Ltd., has maintained a service between England and Australia in alliance with the Federal Steam Navigation Co., the shares in which company are held by the New Zealand Shipping Co. The object of the proposed combination is to make a complete fusion between the New Zealand Shipping Co., Ltd., and the P. & O. and British India companies, thus promoting economy, strengthening the position of all the companies, and generally increasing the efficiency of their joint work.

The property of the New Zealand Shipping Co. includes that company's own fleet, built or in course of building, of about 154,942 tons, and all the shares in the Federal Steam Navigation Co., Ltd., which owns a fleet, built or in course of building, of about 169,590 tons.

* * *

THE 15 ships recently bought by Mr. Hughes, prime minister of Australia, will be operated as a state-owned steamship line, to be called "The Commonwealth Government Line." Their name and tonnage are as follows:

Name—	Date.	Gross tonnage.
Strathendrick	1907	4,379
Strathavon	1907	4,403
Strathairly	1906	4,326
Strathord	1906	4,417
Strathleven	1907	4,396
Strathdee	1907	4,409
Strathspey	1906	4,432
Strathgarry	1907	4,398
Strathbeg	1909	4,338
Strathesk	1909	4,336
Ardongorm	1915	3,570
Ardanmhor	1907	4,454
Vermont	1900	4,271
Daltonhall	1899	3,534
Kirkoswald	1912	4,021

The ten "Strath" ships have been taken from Burrell & Son's large fleet. The commonwealth government has appointed H. B. G. Larkin, commonwealth shipping representative on the high commissioner's staff, to be general manager of the new line, at London. He has appointed Turner, Davidson & Co. to be London brokers of the government line. Many of the vessels are now employed on government business, and as they become available they will be sent out to Australia to load wheat for the United Kingdom.

Asked for a statement on his transaction, Mr. Hughes said:

"The difficulty of obtaining tonnage to transport the products of Australia to the ports of the United Kingdom and those of the allied countries, and the high rate of freight which, except where controled by admiralty requisition or admiralty influence, threatened to become prohibitive, have become so acute that in order to protect the interests of the producers the commonwealth government recently decided to purchase a number of steamers in order to ease the situation.

"The negotiations have now been brought to a satisfactory conclusion and the vessels as they come to hand will be renamed and employed in the Australian trade. The fleet will be known as the "Commonwealth Government Line", and it is hoped that with fair allotment of other British tonnage the producers of Australia, who in normal times market more than 80 per cent of their total output within the empire, will be able to place their products on the home markets.

"The purchase by the Commonwealth government of these steamers will not affect ship owners in the Australian trade. There is ample room for all. But the Australian government line will, so far as its tonnage capacity goes, guarantee Australian producers reasonable freights."

It is understood that for the larger vessels about £140,000 was paid, which, on a deadweight of about 7,500 tons, would represent a value of about $95 a ton. Before the war the value of such ships might, perhaps, have been estimated at about $20 per ton.

The fleet will not be the first state steamship service in Australia. Five vessels are owned by the government of Western Australia, including two of about 3,000 tons each.

* * *

A CIRCULAR has been issued to the stockholders of the Taylor & Sanderson Steam Shipping Co., Ltd., London, suggesting that the fleet of steamers owned by the company be disposed of. The fleet consists of six vessels of 16,259 gross tons. The suggestion of the managing directors is that advantage should be taken of the present high shipping values to realize the assets of the company. As, however, there would be no opportunity for probably some six or seven years of their being able to reenter upon ship management, the managing directors suggest that they should be compensated by payment to them out of the profit realized on a sale of the fleet of such a sum as would be equal to five years' remuneration at the current rate, and they suggest that £50,000 would be a fair and proper sum.

The managing directors and members of their family own very considerably more than half the shares in the company, but they prefer that the matter should, if possible, be decided outside the family vote. It was this desire that led to their issuing the circular.

The fleet of the Taylor & Sanderson Steam Shipping Co., Ltd., is as follows:

	Gross tons.	Net tons.	Year built.
Alexandria	3,865	2,484	1905
Elmstad	689	396	1908
Ernst	653	373	1915
John Sanderson	3,274	2,089	1889
Thornhill	3,848	2,421	1911
Wallace	3,930	2,532	1905

* * *

PYMAN, WATSON & CO., LTD., Cardiff, Wales, a well known shipping and coal exporting firm, have purchased the whole of the ordinary and preference shares of the London & North-

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ern Steamship Co., Ltd. The transaction, which has been pending for some time, is regarded in English shipping circles as of great importance, and is one of the largest Welsh shipping deals that has been completed in recent years. The purchase price, which includes all assets and managing interest, amounts to slightly over £2,000,000, and provides for compensation to the managers, Pyman Bros., Ltd., and a payment to the directors, and a return of about £55 for each ordinary share on which there is paid from £7 to £10.

The fleet of the London & Northern Steamship Co., Ltd., consists of 16 vessels, with a carrying capacity of about 92,000 tons. The steamers are of the ordinary cargo type and range from about 3,000 tons deadweight to 8,500 tons.

The authorized stock of the London & Northern Steamship Co., Ltd., is £500,000 in ordinary and preference shares. Pyman, Watson & Co., Ltd., have already extensive interests in steamships, as well as well known collieries in South Wales. In addition, they are large factors in the coal trade, and carry on a considerable ship broking business.

The principal partners of the firm are J. W. Pyman, who is a director in the Port Talbot Graving Dock & Shipbuilding Co., Ltd., Pyman Steamship Co., Ltd., and the Raithwaite Steamship Co., Ltd., and T. E. Watson, a director of the Port Talbot Graving Dock & Shipbuilding Co., Ltd., and the Port Talbot Railway & Docks Co.

Pyman, Watson & Co., Ltd., will now rank among the largest ship owners in South Wales. The following steamers comprise the fleet of the London & Northern Steamship Co., Ltd.:

Vessel.	Gross tons.	Net tons.	Year built.
Airedale	3,044	1,949	1899
Blagdon	1,996	1,268	1893
Bramham	1,978	1,270	1891
Cloughton	4,221	2,602	1911
Cragside	3,004	1,908	1904
Dalcham	4,809	2,873	1913
Escrick	4,151	2,581	1910
Fallodon	3,012	1,914	1903
Hackness	4,928	2,954	1914
Holgate	2,604	1,657	1896
Langholm	4,167	2,590	1911
Longhirst	3,053	1,952	1904
Normanby	4,219	2,598	1911
Quarrydene	2,883	1,822	1905
Rounton	2,640	1,697	1894
Runswick	3,060	1,940	1904

* * *

ANNOUNCEMENT has been made by A. W. Duckett & Co., New York, that a new service between New York and French and Italian ports has been inaugurated by the Royal Belgian Lloyd, for which they have been appointed New York agents. The first sailing was on Oct. 5, when the Belgian steamer ITALIER (ex WOLHANDEL) left New York for Havre. A direct service to Havre will be maintained regularly thereafter, the steamer AMBOROIX sailing on Oct. 15. The company plans to extend the service later to other French Atlantic and Italian ports. Following the end of the war, the service will also include Antwerp, which will then be the home port of the company.

The Lloyd Royal Belge, or Royal Belgian Lloyd line, was recently formed at the instigation of the Belgian minister of marine and minister of finance to take over the fleet and assets owned and controled by Brys & Gylsen, Ltd., London, Antwerp and Havre, at from 15 to 20 per cent under present market prices. In addition, it is proposed that the company will acquire other fleets under the Belgian flag. Eventually the company plans to purchase a large number of additional ships to carry on the trade from Belgian ports, which, until the beginning of the war, was handled by the German lines. The company has a capital stock of 50,000,000 francs, all of which has been taken up by Brys & Gylsen, who have also subscribed to an issue of 25,000,000 francs 4 per cent debentures. The Belgian government will subscribe to a further issue of 75,000,000 francs 4 per cent debentures.

The government will guarantee both principal and interest of the 100,000,000 francs of debentures and will require in return that the company after the war shall enter into any contracts which the state may deem necessary and shall also start steamship lines which the government may consider to be for the best interests of the country.

The fleet of the company at present consists of 39 steamers, with an aggregate deadweight tonnage of 124,900. The government expects that this fleet will be increased within the next few years to from 90 to 100 steamers, whose deadweight tonnages will aggregate 500,000 to 600,000. It is with this object in view that it plans to guarantee a debenture issue representing twice the paid-up capital of the company.

During the course of the war the Belgian government has the right to requistion 50 per cent of the company's vessels of Belgian registry at Blue Book rates and the balance for the Belgian relief at the lowest rate paid to a United Kingdom port, less 30 per cent. Those vessels of the company that fly the British flag will have to meet the requirements of the British government, exactly as all other British ships.

A. W. Duckett & Co. have for several years been the agents in this country and Canada of Brys & Gylsen, Ltd., and their appointment as agents of the Royal Belgian Lloyd Co. was expected.

The fact that the Belgian government has lent its support in such degree to the new company, in which it will have the controling influence, is regarded by shipping men in this country as emphasizing the united purpose of the allies in the trade war that may follow the present conflict. The plan which has been adopted is looked upon as only a step removed from direct government ownership.

* * *

THE annual report of the Compagnie Generale Transatlantique, better known as the French line, recently made public shows that France's merchant marine has grown instead of diminished since the war began. Among other vessels, the compay has built and placed in commission a modern passenger steamship of 14,800 tons, and it has maintained an uninterrupted passenger and freight service between France and the western hemisphere.

At the beginning of the war the French line placed every available steamship at the disposal of the government, and its private ship yards, dry docks and workshops were thrown open to the French naval constructors and ministry of marine. Notwithstanding an almost total absence of tourist travel, the reduction to an insignificant minimum of westward emigration traffic and losses incurred through submarine activity, the report shows a substantial profit, due to large freight traffic.

In 1915 the French line offset the losses incurred through requisitions and the acts of enemy submarines by placing in commission, besides these vessels, LAFAYETTE, VAUCLUSE, LA NIEVRE, ARDECHE, MONT BLANC, LA DIVES, SAINT ANDRE, SAINT JOSEPH, SAINT JEAN, SAINT LOUIS, and SAINT MARC. In December, 1915, the company had 85 steamships, a total net tonnage of 394,004, and 389,860 horsepower, an increase over 1914 of one steamship, 6,414 net tonnage and 4,500 horsepower.

The heavy demand in France for material and labor has retarded construction of the gigantic new steamship PARIS, which was to have been completed and placed in commission last year. But work on PARIS has been continued steadily, and it is expected that she will be ready for service soon after peace is declared. She was launched recently.

* * *

A NEW freight steamship line operating between Philadelphia and South American ports has been organized with a capital of $1,000,000. The first of the six vessels now in possession of the company sailed recently for Rio de Janeiro, and will

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touch at Santos, Montevideo and Buenos Aires.

The company will be known as the Philadelphia & South American Steamship Corporation and will operate the Philadelphia-South American Line. It will be financed almost entirely by New York capital, although the undertaking was planned by the Philadelphia chamber of commerce as a means of stimulating trade between that city and the southern continent.

Monthly sailings have been arranged under the present schedule, but later, when the number of vessels will be increased, bi-monthly sailings will be undertaken. No passengers will be carried on any of the boats.

Herman L. Wright, New York, is president of the corporation, and the vice president is John E. Liggett, New York, who is a director of several New York banks, the Hudson Steamship Co., the Eastern Steamship Corporation, the Clyde Steamship Co., and the Mallory line.

The Pennsylvania railroad company figured extensively in the organization of the new line. The ships will dock at the railroad's pier on the Delaware. Coffee, iron and steel will probably constitute the chief part of the cargoes. The largest vessel will have a freight capacity of about 10,000 tons.

* * *

THE New York & Cuba Mail Steamship Co., more widely known as the Ward Line, has announced a new service to the west coast ports of Central America and Salina Cruz, Mexico. The first ship has sailed and ships will leave thereafter every 21 days. The vessels which will be used in the service will all be fast boats. The ships will carry freight only, according to the first announcement, and will use the Panama canal. The Ward line operates services to Cuba, Mexico, Nassau, the west coast of Mexico and Central America at the present time.

* * *

A NEW service between New York and Brazilian ports will be inaugurated by Norwegian ship owners shortly, according to an announcement made by the Kerr Steamship line, which will act as loading agent for the Wilhelmsen Steamship line. Wilhelm Wilhelmsen, Tonsberg, Norway, one of the largest individual owners and operators of Scandinavian tonnage, is the owner of the new line. He has been considering for some time past the advisability of putting some of the steamers regularly in the South American trades, and believes that the time is favorable to such a venture.

A. E. Clegg, vice president of the Kerr line, said that four steamers had already been named for the service, as follows: TYR, sailing Oct. 25; TRICOLOR, sailing Nov. 10; TRAFALGAR, sailing Nov. 25, and TIMES sailing in December. E. Johnston & Co., Ltd., Santos, and the Brazilian Warrant Co., Ltd., Rio de Janeiro, closely identified with the handling of steamers at Santos and Rio de Janeiro for many years, have been appointed agents for the steamers at the ports named.

The vessels, besides making Rio de Janeiro and Santos regular ports of call, will also take cargo for Pernambuco, Bahia, Florianapolis, Paragua, Sao Francisco do Sul, Rio Grande do Sul, Pelotas and Port Alegre if required.

* * *

IN a recent issue the *Panama Canal Record* publishes a list of the lines which have established regular or approximately regular services through the canal since the resumption of traffic in April. The list includes four services from the Atlantic terminus to South and Central America, one from the Atlantic terminus to Central and North America, three from the Atlantic coast of the United States to the Pacific coast of South America, four services from Europe to the Pacific coast of South America, four from Europe to the west coast of North America, nine from the Atlantic coast of the United States to Japan, Siberia, China, and the Philippine islands, six from the Atlantic coast of the United States to Australia and New Zealand, and two from Europe to Australia and New Zealand.

* * *

IT is announced that the J. G. Rainwater Lumber Co., New Orleans, has purchased SAN RAMON and chartered five other vessels to establish a new line between New Orleans and Cristobal-Colon, to be known as the San Ramon Steamship line. The principal business of the new line will be the transportation of lumber, for which the Rainwater company has received an order for 8,500,000 feet from the Panama canal for use on the canal zone. It is said that SAN RAMON will make a trip every 22 days.

Lower Transpacific Rates

George E. Anderson, American consul general at Hong Kong, China, states that there has been a sharp decline in transpacific freight rates, and at present rates comparable with those obtained previous to the war are being quoted. General business slackness in the far east, due to some extent to the high value of silver exchange, which prevents the sale of Chinese products abroad to advantage, has resulted in a marked decrease in the movement of produce. As usual under such circumstances, the subsidized Japanese lines have cut rates. Several large tramp steamers have come into the market for cargoes and additional tonnage has been offered from other sources. The result has been a general collapse in rates eastward, which is likely to obtain until some of the tonnage now in service on the Pacific is transferred to other routes and until a change in the silver situation permits a renewal of active export to the United States and Canada. Rates from Hong Kong and China ports to the United States and Canadian overland common points at the present time are open and competitive.

The China coast freight situation is completely demoralized. Rates on rice from Saigon to Hong Kong, usually counted as the basic rate for coastal freights, have fallen sharply. Chartering is slow in consequence, and it is likely that it will be some time before there will be a readjustment more in accordance with freight conditions in other parts of the world.

Regulation of Shipping

The Australian naval authorities, who have complete control of all British shipping in Australian waters, are endeavoring to devise means which will lead to better organization of the tonnage at present available and divert it into channels which will be more profitable for the commonwealth as a whole.

The proposal is that all ships coming to Australia should call at one port only. At present most of the vessels call at Fremantle, Adelaide, Melbourne and Sydney, discharge a little cargo at each port and load cargo similarly on the return trip.

It is estimated that each ship would under the new order save on an average 14 days on each trip. The cost of running an average 5,000-ton steamer is estimated at approximately $2,000 a day. On this calculation every ship would save on an average $20,000 a trip, plus port dues, which would be avoided at three ports at which no call was made. Putting the number of vessels calling at Australia at 300 a year, this would give a clear saving of more than $7,500,000 a year, and the saving in time is calculated to give the equivalent of 50 additional vessels a year. It is not intended that any one port should be selected for the carrying out of the idea, but that all ports might be used. The authorities also are studying the organization of labor on the wharves as it is said that thousands of dollars could be saved if the wharf laborers would work loyally and continuously.

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Big Pacific Ship Merger

THE merger of the big fleets of the Pacific-Alaska Navigation Co. and the Pacific Coast Steamship Co. formally announced recently makes Tacoma, Wash., the home of the largest fleet of first-class passenger and freight steamers of the American Pacific coast. The big corporation will be headed by H. F. Alexander, a citizen of Tacoma. The merger, affecting 22 vessels, now handling practically all the passenger business and a majority of the freight business between northern and southern ports on that coast will go into effect Nov. 1.

While no financial details have been given out, the vessels involved are said by prominent shipping men to be valued at the present time at more than $12,000,000. Under one head and with one service, the new fleet will include the best and the largest number of freight and passenger carriers ever operated on that coast. The merger is the culmination of many months of personal work by H. F. Alexander, and is the realization of his ambition of years to build an effective coastwise fleet of first class steamers.

In giving the details of the consolidation, President Alexander made the following statement:

"The Pacific Steamship Co. has been formed by a consolidation of the Pacific Coast Steamship Co. and the Pacific-Alaska Navigation Co. to operate along the entire Pacific coast, including Alaska, with the further purpose of extending its service in other directions. Arrangements have been made to operate all vessels of the two companies.

"In view of the great scarcity of vessels on the Pacific coast, due to the greater demand for them in other trades and the inability to secure additional vessels under existing conditions for the trade of the Pacific coast, the combined companies, after carefully considering the situation, have decided that they can best serve the interests of the public with more frequent sailings by operating the two fleets under a management that will eliminate the disadvantages to the traveling and shipping public which necessarily attend the operation of the two fleets separately."

The principal officers of the new company are H. F. Alexander, Tacoma, president; E. C. Ward, Seattle. vice president; R. J. Ringwood, San Francisco, vice president in charge of traffic; William Jones, Tacoma, treasurer; E. B. Rogers, Tacoma, secretary, and A. F. Haines, Seattle, manager.

The directors of the Pacific-Alaska Navigation Co., are: Chester Thorne, William Jones, W. C. Morrow, S. A. Perkins and H. F. Alexander, all of Tacoma; E. A. Stuart, James D. Hoge, and M. A. Arnold, all of Seattle; R. P. Butchart, Victoria; Theo. B. Wilcox, Portland; D. C. Jackling, R. J. Ringwood and Henry T. Scott, all of San Francisco; George Mair, Windsor, Ont.; R. A. C. Smith, New York. The directors of the Pacific Coast Steamship Co. are: Henry W. Cannon, Albert H. Wiggin, John W. Simpson, John I. Waterbury, and William M. Barnum, all of New York; Lewis K. Thurlow, Edward Pierce and Washington B. Thomas, all of Boston. The directors of the Pacific Steamship Co. will be chosen from the directors of the two companies.

The merger involves ships having a gross tonnage of more than 55,000 tons, the tonnage of the Pacific Coast Steamship Co. being more than 34,000 and that of the Pacific-Alaska Navigation Co. more than 21,000.

The steamship CONGRESS of 7,985 gross tons, which was damaged by fire recently near Marshfield, Ore., is the largest vessel involved in the transaction. CONGRESS, which was valued at $2,000,000, was completely swept by fire, but the hull and engines are in good condition and she soon will be repaired. The other vessels of the Pacific Coast Steamship Co.'s fleet which will be taken over by the new company are: PRESIDENT, 5,218 tons; GOVERNOR, 5,250 tons; SPOKANE, 3,279 tons; UMATILLA, 3,069 tons; QUEEN, 2,772 tons; SENATOR, 2,409 tons; CITY OF SEATTLE, 1,462 tons; CURACO, 1,503 tons; CITY OF TOPEKA, 1,057 tons; RAVALLI, 998 tons; AURELIA, 424 tons, and HOMER, 501 tons.

The fleet of the Pacific-Alaska Navigation Co., known as the Admiral line, consists of ADMIRAL DEWEY, 2,104 tons; ADMIRAL EVANS, 2,393 tons; ADMIRAL FARRAGUT, 2,141 tons; ADMIRAL SCHLEY, 2,104 tons; ADMIRAL GOODRICH, 1,417 tons; ADMIRAL WATSON, 1,955 tons; ADMIRAL SEBREE and the fast turbiners under long charter to the company for service between San Francisco and San Diego, YALE, 3,107 tons and HARVARD, 3,137 tons. All of the vessels of both fleets are engaged in coastwise service on the Pacific except ADMIRAL SEBREE, which was bought last year by the Admiral line on the east coast and is now engaged under charter in the sugar trade out of New York.

W. R. Grace & Co. have awarded a contract for two auxiliary vessels for the trade from Tacoma and other north Pacific ports to the west coast of South America. The new ships will be 225 feet in length, 42½ feet in beam and 15 feet depth of hold. They will be built especially for the lumber carrying trade and the contract calls for their completion early in 1917. The machinery will be installed at San Francisco.

The End of Matanzas

By David A. Wasson

After a long series of mishaps which made her conspicuous in coast maritime circles, the 929-ton bark MATANZAS, one of the last of her rig built on the Atlantic coast, has come to a tragic end. She foundered some time ago, while bound on the first deep sea voyage she had undertaken in many years. Of late she had been making her livelihood in the coastwise trade, but her last venture was from Newport News with coal for Cadiz, Spain, in charge of Captain Harry Nuss, Mystic, Conn.

The four-masted schooner BAYARD BARNES, from Norfolk for Para, Brazil, found the skipper and the two survivors of the bark's crew of 10 and rescued them in a terrific gale, a feat that reflects much credit on Captain A. H. Gray of the schooner. The survivors were at the point of death, seven companions having perished from exposure.

The unlucky windjammer had been through all manner of disasters in the last few years. On Dec. 2, 1901, she anchored off Townsend inlet, N. J., in a bad position, crippled by offshore gales. Assistance was sent her and she was taken into New York in tow before the dreaded lee shore claimed her. Caught off Hatteras in the great gale of Dec. 26, 1908, with a cargo of lumber from Fernandina for Philadelphia, she sprang a leak and was picked up in the nick of time by a coast guard cutter, which towed her into Hampton Roads in a water logged condition.

On Nov. 9, 1909, she was blown ashore at Puerto Plata, San Domingo, in a gale. Although she was loaded with coal, the wooden craft survived the shock. In December, 1912, while on a voyage to the West Indies with coal, she put into Bermuda in distress, and promptly went ashore on the coral reefs, being floated by a bare margin. And later she piled up on Cape Cod when the tug JOHN G. CHANDLER, which was towing her from Boston to Philadelphia, got a line in her wheel.

MATANZAS was built at Bath in 1889, and was the only square rigger in the big sailing fleet of Pendleton Bros. of New York.

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Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE apportionment of a salvage reward between the owners of the salving vessel and her officers and crew was in issue in Conekin vs. Lockwood, 231 *Federal Reporter* 541, and it was there held that there is no fixed rule, but that distribution is a matter resting in the discretion of the court, and governed largely by the peculiar circumstances of each individual case. In this connection it was said: "As salvage is a reward for the encouragement of voluntary promptness, energy, efficiency, and heroic endeavor in saving life and property in peril on the seas, the claims of the master and crew who evince these qualities and undergo the perils are regarded with the most favorable consideration. In the days of sailing vessels, as the salvage depended more upon the individual efforts of the salving crew than the efficiency of the salving vessel, the position of the crew was much more favorably regarded, and the larger part of the salvage award was generally apportioned to the officers and crew. The use of steam, however, has largely changed this. Under the general use of steam it is really the vessel which conduces most to the effectuation of the salvage result, and salvage is largely now considered from the standpoint of a sufficient reward to induce salvors to keep ready and in position steam vessels efficiently equipped with pumps, tackle, etc., to render salvage service. It is more difficult to procure that there are kept on hand steam vessels possessing motive power and salvage equipment in an efficient position to render salvage services than it is to find individuals who would use inefficient attempts. The proportions, therefore, have varied so as to allow a much larger proportion to the owner of the vessel. So, too, the master upon whom the responsibility of the direction and the determination to make the effort exists is allowed frequently a larger proportionate share than the rest of the crew, although an exception is made in the case of such members of the crew as may show exceptional effort and merit in their services."

* * *

In the case of A. A. Raven, 231 *Federal Reporter* 380, it appeared that a government dredge, injured in collision so as to necessitate repairs, employed a crew of 58 men, who were not ordinary seamen, but were artisans or mechanics selected from a large number for their skill, efficiency, and experience; it was also shown that three weeks was a reasonable time for making the repairs. The question was: Should the crew have been discharged for the three weeks to save expense to the vessel in fault for the collision? The court held in the negative, saying that men such as composed the crew cannot be easily replaced from the wharf or a sailors' lodging house and that they were important factors in the work, and that the government should not be obliged to disperse an organized force, gathered with such care, and run the risk of reassembling the men after the vessel should be ready to resume work. The situation should be tested by what an ordinarily prudent business man would do, and "such a man would keep the crew together for three weeks under pay rather than risk their loss."

* * *

A tug navigating in a fog and, knowing that there is a tug and tow ahead, which proceeded, without changing course or speed, which was four miles an hour, until right on top of the tow, was held liable in Port Johnson Towing Co., No. 7, 232 *Federal Reporter* 141, for the resulting collision.

* * *

There being no statute covering the matter, a health officer has no lien enforceable in rem against a ship bringing into port passengers stricken with disease or exposed to infection, for expense of board, lodging, and hospital service rendered while such passengers were detained in quarantine.—ATHINAI, 230 *Federal Reporter* 1017.

* * *

A ship is not relieved from liability for damage to her cargo on the ground of dangers of the sea, it was decided in ERSKINE M. PHELPS, 231 *Federal Reporter* 767, where the cargo was accepted with full knowledge of its character and the manner in which it was packed.

* * *

The charterer of a steamship for carrying a cargo of wheat from Baltimore to one of the six ports, Avonmouth, London, Antwerp, Rotterdam, Havre, or Dunkirk, in August, 1914, was not justified in refusing to load the vessel on account of the European war, according to Furness, Withy & Co., Ltd., vs. Louis Muller & Co., 232 *Federal Reporter* 186, it appearing that none of the named ports was blockaded, and that other vessels carried cargoes safely at about the same time.

* * *

The fact of quarantine at Porto Rico under which a steamer, after docking at San Juan, would not be permitted to dock at any other port, did not excuse failure of a steamship company to deliver a cargo at Guanica, if in the exercise of ordinary prudence quarantine could have been avoided, as by lightering the San Juan cargo, or proceeding to other Porto Rican ports before unloading the San Juan cargo.—New York & Porto Rico S. S. Co. vs. Guanica Centrale, 231 *Federal Reporter* 820.

* * *

Recovery for salvage services rendered in saving munitions of war in possession of a lightering company and destined for the use of the Russian government may be had, it was held in Johnson Lighterage Co., No. 231 *Federal Reporter* 365, it appearing that such company had contracted to transport such munitions from a railroad terminal to a vessel, but had no other connection with the Russian government, and the munitions being still in its possession when libeled and seized by the marshal.

* * *

Where there is delay in the surrender of a ship at the end of a time charter, or an "overlap," so-called, it was held in Constantine & Pickering S. S. Co. vs. West India S. S. Co., 231 *Federal Reporter* 472, the owner may recover the best going rates of hire at the place of delivery. That rate, however, is not necessarily the highest that could have been obtained for an outbound cargo, but, as affecting such rate, it is proper to take into consideration the position in which the ship would be left at the end of the outward voyage with respect to securing another cargo.

* * *

The master of a ship is the agent of the owner, and like any other agent his appointment or authorization lies in contract, so that a master is not lawfully such where he is not appointed, or his appointment authorized, by the owner, though he has had himself enrolled as such. In the case of CALYPSO, 230 *Federal Reporter* 962, the interest of a majority owner in a launch was held not subject to forfeiture because the owner of a one-sixth interest had himself enrolled as master, and then brought a load of contrabrand Chinese from Mexico to a port of the United States.

* * *

A consignee, who receives a cargo under a bill of lading which contains an agreement that he shall pay the freight, becomes personally liable therefor, but his liability, it was said in Vane vs. Wood & Co., Inc., 231 *Federal Reporter* 353, is limited to the amount for which the ship has a lien, and where under a charter the ship is to be paid a per diem freight he is liable therefor only up to the time when his goods are discharged. The liability of a shipper, whose contract was with the charterer, and who did not receive the bill of lading, which referred to the charter, of which he had no knowledge, is determined by his own contract with the charterer.

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American Ship Yard Activities

A Snappy Summary of the Leading Events of the Month in the Vessel Construction Field

Plate Shortage Delays Construction

THE present existing shortage of steel plates for ship building is likely, in the opinion of steelmakers, to affect seriously the increase of new ocean and lake tonnage in other countries, as well as the United States. The mills are working under the highest pressure possible, yet orders have to be turned away daily irrespective of the premiums which ship builders are willing to pay for steel in early deliveries.

Into this congestion is expected to come shortly inquiries from the government for at least 100,000 tons of plates in carrying out the new naval program. The steelmakers are spending considerable time in wondering how the situation can be worked out to the satisfaction both of the government and private builders without causing hardships for all consumers with urgent needs.

The steel mills have not in recent years developed manufacturing capacity for the big plates used in making ships at the same rate that capacity for other materials has been extended. This covers the situation in brief fashion. Bar mills, tube mills, rail mills, and structural plants have been put up in large number by the United States Steel Corporation and the leading independent companies, while the equipment for turning out plates has been expanded slowly. There was ample reason for this. For many years before the war began steel ships were not built in American yards on a scale by any means commensurate with construction in Great Britain and the Scandinavian countries, where labor was cheaper and materials no dearer than in this country. The boom caught the steel men without means to take complete advantage of the demand.

Japan is one of the countries being affected by the overcrowded condition of American mills. It is known that when the ship building boom got under way last year Japanese yards were quickly filled with contracts. For those taken on earliest the shipmakers engaged to buy the steel on their own account, and were able for some months to do so with reasonable certainty of securing deliveries from the United States, China, and India in time to carry out the letter of their contracts. It was estimated a few weeks ago that the Japanese had bought up to July, 1916, between 60,000 and 100,000 tons of ship steel from American mills, but when the market began to grow tight there was a radical change in the methods of these manufacturers. They discussed new contracts for ships with the provision that the buyers must make his own arrangements for securing the necessary steel. The buyer, it is said, now finds it almost impossible to secure plate mill room in this country until around the middle of next year, a situation which must slow down the rate of output of new ships.

May Build More Mills

The condition in home ship yards naturally is much the same as in other countries, although long-time customers are receiving as generous treatment as the millmen find possible. The Bethlehem Steel Corporation, owning or controling four important ship yards, has always bought its ship plates of competitors. Mr. Schwab evidently found in normal times that with plates selling under 2 cents a pound, against 4 cents now, and the demand not much more than nominal, it was cheaper to buy his steel than to spend several millions of dollars on a new plant. The building program now under way at the Bethlehem steel mill may contain provision for plate mills, as there is considerable more profit in the business than three years ago and prospects continue good, the steelmakers think, for a healthy demand at high prices for several years to come.

The Maryland Steel Co., Sparrows Point, Md., which is controled by the Bethlehem company and has one of the best equipped ship yards in the country, also has to buy its plate, not being equipped with a mill, and the Pennsylvania Steel Co. is another in the same situation. These companies passed into control of the Bethlehem Steel Corporation a few months ago, and as the Maryland's yard is contemplating good business a long time ahead, it seems reasonable to assume that the manufacture of plates will be undertaken before long.

The Steel Corporation is the largest maker of plates in the country, with the Worth Bros. Co., which was absorbed by the Midvale Steel & Ordnance Co. last year, standing second. The latter has four mills in operation, it is understood, and a few weeks ago it was announced that another would shortly be built. At the time this information became public it was learned, also, that the Midvale company had secured an order from Japan for 10,000 tons of plates.

Figures showing the aggregate plate mill capacity of the country are not available, but the records of output of steel and iron plates combined in the last two years has been prepared by the American Iron and Steel Institute. They do not indicate how much was taken by the ship builders, but do show that an increase of substantial proportions occurred in 1915 over 1914, as is here set forth:

	1915. Tons.	1914. Tons.
Universal Plates—		
¼-inch thick or more....	905,026	712,258
Under ¼ inch.....	49,826	53,855
Total	954,852	766,113
Increase, 1915, 188,739 tons.		
Sheared Plates—		
¼-inch thick or more....	1,459,422	1,025,971
Under ¼ inch.....	463,777	320,337
Total	1,923,199	1,346,308
Increase, 1915, 576,891 tons.		

Universal plates are distinguished by the fact that the edges are rolled smooth, as well as the sides, while sheared plates are rolled with rough edges which have to be cut to the required size. Plates rolled for ship construction are sometimes 11 feet in width, and special and expensive rolls are required to do the work properly.

Huge Car Float Launched

A ferryboat which can be readily converted into an armed transport in case of war was launched Sept. 25, at the ship yard of the William Cramp & Son Ship & Engine Building Co., Philadelphia. The vessel is JOSEPH A. PARROTT. Senora Cespedes, wife of the Cuban minister to the United States,

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sponsored the novel craft, which was built to augment the car ferry service of the Florida East Coast railway between Key West, Fla., and Havana, Cuba.

The vessel has a capacity of 30 of the largest freight cars, fully loaded; can develop a speed of 12 knots, and will make the 96-mile trip between the two cities in eight hours. She is so constructed as to give ample facilities for mounting 5-inch rapid-fire guns and smaller batteries if needed for naval service.

Launch Ship of New Type

A NOTABLE addition to the fast growing mercantile fleet of the United States, EDWARD LUCKENBACH, was launched Sept. 14, at the yard of the Fore River Shipbuilding Corporation, Quincy, Mass., for the Luckenbach Steamship Co., New York. This vessel will enter the coast to coast and the oversea trade. She has the following dimensions: Length over all 456 feet 6 inches; length on waterline, 449 feet 3 inches; beam molded, 57 feet; depth molded, 41 feet 6 inches; deadweight carrying capacity, about 10,000 tons.

EDWARD LUCKENBACH, as shown in the illustration on page 384, is a vessel of distinctive appearance and individuality. She differs from other vessels of the Luckenbach fleet, her designers having provided for a modified cruiser stern, a novel arrangement of bridge and deck-house bulwarks, a large smokestack amidships, and two masts and eight kingposts. She is the first of five steamers now under construction by the Fore River Shipbuilding Corporation for the Luckenbach Line. The vessel is of the shelter deck type with wide-spaced hold stanchions, no side stringers, and wide-spaced frames designed for the economical carriage and rapid handling of general freight.

She was built to meet the full requirements for hull, equipment and machinery of both the American Bureau of Shipping and Lloyds Register of Shipping and has one of the highest classification ratings with freeboard assignment, in the records of these societies.

The propelling machinery consists of a single curtis turbine, driving through a high and low-speed reduction gear designed to deliver 4,000 shaft horsepower at 90 revolutions per minute. The maximum shaft horsepower will be 4,500 with the revolutions of the propeller not exceeding 93. The turbine is designed to work with a steam pressure of 195 pounds in the steam chest and against a vacuum of 28 inches. The turbine is so arranged that the head and reverse turbines are carried on one shaft and contained in one casing. The stern turbine is designed to deliver to the shaft not less than 50 per cent of the power of the ahead turbine. The total reduction of speed between the turbine and propeller shaft is made in two steps, known as the double-drive type; that is, pinions drive two gears, one diametrically opposite the other, thereby eliminating the pressure on the pinion bearings. The high-speed pinion is directly connected to the turbine shaft by means of a flexible coupling so arranged that any actual motion in the gears or pinions is not transmitted to the turbine shaft. Each wheel carries a right and left helical gear. The low-speed reduction gear consists of a large gear wheel driven by two pinions, each pinion being driven through a flexible connection by one of the wheels in the highspeed gear casing.

The propeller is 19 feet in diameter with blades set at a pitch of 16 feet; the pitch, however, being adjustable between 15 and 17 feet. The propeller hub is cast iron and the blades manganese bronze.

Steam is furnished by three single-end Scotch marine-type boilers each 16 feet 6 inches, inside diameter, and 12 feet 3 inches long, having a total heating surface of about 10,500 square feet. Each boiler has four Morrison corrugated furnaces, 42 inches inside diameter, and is arranged to burn fuel oil on the Dahl system. The necessary pumps, filters, heaters, etc., are arranged in the fireroom. Fuel oil for the boilers is carried in the double-bottom compartments in the forward and after peak tanks. The quarters for the officers and crew have received special consideration to insure good light and ventilation.

New Mallory Ship Launched

Arthur W. Pye, passenger traffic manager of the Mallory Line, announces that the company's new steamship, HENRY R. MALLORY, was successfully launched at the yards of the Newport News Ship Building & Dry Dock Co., at Newport News, Va., on Aug. 19.

The vessel was named by Mrs. Henry Mallory, New York. This is the third large passenger and freight steamship built for the line in the last two years.

Since 1837, when Charles Mallory built the first American clipper ship at Mystic, Conn., and sent her out from New York to trade with China and Japan, the family has been interested in the shipping business in that city.

The new liner is 439 feet long, 54 feet beam and 34 feet deep, and will have accommodation for 100 first-class and 100 third-class passengers.

The general plan of HENRY R. MALLORY is much on the order of a transatlantic liner, but with more spacious cabins, suitable for the semi-tropical trade between New York and Galveston. The heating, lighting, ventilating and sanitary arrangements have all been carried out on the most modern lines, under the direction of President H. H. Raymond. It is expected that the new steamship will be brought to New York in November and make her maiden trip to Galveston early in December.

Brazil Aids Shipping

Backed by energetic government support, ship builders of Brazil are now engaged in constructing a merchant marine fleet such as will, when complete, make that country's commerce independent of foreign restriction, according to Oscar Correia, vice consul and assistant to Consul General H. C. De Martins Pinheiro of New York.

The ship yards of Brazil, according to Mr. Correia, are all busy and working full capacity. A new fleet of merchant vessels, between eight and 12 in number, and of 5,000 to 10,000 tons each, is to be floated as soon as it is possible to do so. As rapidly as completed the vessels will be put under the flag of Brazil and entered in her trade. The Compania Nacional de Navagacas Costeria is building at Vianna island, in the harbor of Rio de Janiero, a freight ship of 10,000 tons. The keel was but recently laid, and its laying was the occasion of a celebration attended by the president of the republic and his cabinet.

This ship, Mr. Correia states, was contracted for prior to the opening of the European war with a British ship building firm and most of the material had been turned out and assembled. Construction being interrupted by the war, the owners, through the Brazilian government, arranged with the British builders to ship the material to Brazil. This ship will be followed by five or six more of 5,000 to 7,000 tons each.

Another company engaged in building up the merchant marine, Mr. Correia adds, is that of Francisco des Santos Caneco. Within the last few weeks the keel of a freight ship to be known as PRESIDENTE WENCESAU, was laid in the presence of official representatives, and other vessels are to follow as fast as possible.

Other lines already in the trade, among them being the Lloyd Brazil-

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eiro, are taking the same initiative in increasing their fleets. The Lloyd Brazileiro now has in the United States several representatives, Mr. Correia states, whose mission, it is understood, is to purchase ship yard equipment.

Another New Yard

Six ways, each 600 feet long, are under construction at the new ship yard of the International Steel & Ship Building Co., recently organized which is building a new yard at Quantico, Va. A tract of 55 acres of land is held by the company, permitting of liberal future extensions. The International Steel & Ship Building Co. is a Delaware corporation with a capital stock of $2,500,000, consisting of $2,000,000 of common stock of the par value of $10 and $500,000 of preferred stock of a par value of $100. The headquarters and offices of the company are located at Washington, D. C.

Shipping on the Pacific

A RECENT report by the bureau of foreign and domestic commerce points out that while the war has cut down the total shipping of all nations engaged in transpacific trade from 380,000 gross tons to 280,000, and the American share, at its lowest mark of the past two years, had fallen from 21 per cent to 2 per cent of the total, recent developments have shown that gradually the American flag is returning to the Pacific.

The report states that the United States has more merchant vessels under construction than any other country in the world, and while the greater part of this new tonnage is not intended for immediate use in the far east, it is probable that sooner or later some of it will be diverted to that trade. The recent purchase of three large ships by the Pacific Mail Steamship Co. marked the turning point. It adds 17,100 gross tons to the 5,000 tons that remained. Prior to the war the total American tonnage engaged in this trade was 80,000 gross tons.

Before the war British shipping represented 39 per cent and Japanese 33 per cent of the total. When our share was at its lowest point, however, British tonnage had fallen off to 30 per cent, Japanese tonnage had increased to 55 per cent of the total, and Dutch shipping had jumped from practically nothing at all to 13 per cent. English tonnage fell from 150,000 gross tons to 84,000 tons, Japanese tonnage increased from 125,000 to 155,000 tons, and the Dutch increased from a negligible quantity to 35,000 tons.

A very interesting section of the report is devoted to ship building activities in Japan and China. Japanese ship yards are taxed to the limit of their capacities. Orders for ships from abroad have been refused, as the yards have booked orders for Japanese ships that will keep them busy for the next two years. The builders, however, are handicapped by a lack of material, and it is an interesting fact that one large new ship building company is buying all of its material from this country. Boilers, engines and other fittings cannot be had at very reasonable prices for they cannot be manufactured at home as cheaply as they can be turned out in the United States and England. But in spite of all handicaps, Japan is losing no time in taking advantage of the present unparalleled opportunities. Purchases of foreign ships have been made at very high prices. The Chinese also are busy at their yards in Shanghai and Hongkong, although badly handicapped by scarcity of materials. One Hong Kong company is at work on eight ocean freighters for Norwegian owners.

Naval Construction

The bureau of construction and repair of the navy department recently issued the report shown in the accompanying table detailing the progress made in the construction of government vessels during August. The report shows that work is now under way on five battleships, of which only two are being built in private yards. A sixth battleship, TENNESSEE, also will be built in a government yard. Three privately built battleships have been completed in recent months, these being NEVADA, built by the Fore River Shipbuilding Corporation, Quincy, Mass.; OKLAHOMA, built by the New York Ship Building Co., Camden, N. J., and PENNSYLVANIA, built by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

In addition to the vessels shown, about 35 submarines are under construction, of which about 30 are being built in private yards. These yards are those of the Lake Torpedo Boat Co., Bridgeport, Conn.; the Electric Boat Co., Quincy, Mass., and the California Shipbuilding Co., Long Beach, Cal. Submarines are also being built at the New York, Portsmouth, N. H., and Puget sound navy yards.

U. S. Naval Vessels Under Construction

No.	Name of Vessel.	Contractor.	Per cent of completion. Sept. 1, 1916. Total.	Sept. 1, 1916. Per cent on ship.	Aug. 1, 1916. Total.	Aug. 1, 1916. Per cent on ship.
		BATTLESHIPS.				
39	Arizona	New York Navy Yard	98.8	98.7	95.4	95.2
40	New Mexico	New York Navy Yard	43.5	36.0	40.0	32.5
41	Mississippi	Newport News S. B. Co.	53.3	45.0	50.9	42.9
42	Idaho	New York S. B. Co.	63.4	59.9	62.3	59.0
43	Tennessee	New York Navy Yard	....	....	....	....
44	California	Mare Island Navy Yard	1.7	....	....	....
		DESTROYERS.				
64	Rowan	Fore River S. B. Corpn.	[2]		96.3	96.3
65	Davis	Bath Iron Works	94.0	93.9	88.5	88.2
66	Allen	Bath Iron Works	88.5	88.3	87.4	87.0
67	Wilkes	Wm. Cramp & Sons	86.5	86.1	81.1	80.4
68	Shaw	Mare Island Navy Yard	57.3	56.6	44.8	43.9
69	Caldwell	Mare Island Navy Yard	11.3	5.7	....	....
70	Craven	Norfolk Navy Yard	7.5	....	1.6	....
71	Gwin	Seattle Constr. & D. D. Co.	9.8	....	9.7	....
72	Conner	Wm. Cramp & Sons	9.7	3.2	8.6	3.0
73	Stockton	Wm. Cramp & Sons	9.9	3.2	8.8	3.0
74	Manley	Bath Iron Works	19.5	10.5	16.3	7.5
		FUEL SHIPS.				
14	Maumee[1]	Mare Island Navy Yard	99.7	99.7	99.7	99.7
15	Cuyama	Mare Island Navy Yard	78.2	76.9	73.3	71.7
		MISCELLANEOUS				
	Bridge (Supply Ship No. 1)	Boston Navy Yard	82.3	81.3	77.0	75.5
	Henderson (Transp. No. 1.)	Philadelphia Navy Yard	72.4	70.7	70.2	68.3

[1]Vessel now at Navy Yard, New York, for installation of engines.
[2]Delivered Aug. 19.

Plans for extensive improvements along the Delaware river front of Philadelphia have been completed.

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Japan's Marine is Growing Steadily

The Progressive Nation in the Far East is Making Remarkable Strides in Building Up a Merchant Marine—Ship Yards Are Working at Full Capacity

AN ARTICLE appearing in the special Japanese section of the *London Times* shows the influence of the war and recent tendencies in Japanese ship building. Dealing with merchant ships, the article, which is contributed by Professors F. P. Purvis and S. Terano of the Tokio Imperial University, says:

"In these days steamers necessarily attract paramount interest in Japan as in other parts of the world. Sailing vessels of the junk class are, of course, still built, and in large numbers, but since 1910 these numbers appear to have been slowly declining; sailing ships of modern construction again are holding their own; indeed, are increasing in number and aggregate tonnage about as rapidly as steamers; but they are essentially small in size, the register of the country containing one only which exceeds 500 tons gross. Restricting attention then to steamers, and to steamers exceeding 100 tons gross, the growth in number and aggregate tonnage during the past few years is as follows:

JAPANESE STEAMERS OVER 100 TONS

			Built in Japan.	
	No.	Gross tons.	No.	Gross tons.
1907.....	848	1,066,432	...	.....
1911.....	970	1,333,498	...	.....
1915.....	1,096	1,557,757	667	600,182

"Of the 1,096 steamers at present on the register, 66 have a gross tonnage exceeding 5,000 and six a gross tonnage exceeding 10,000. The 22 largest ships on the register were all built in Japan. Compared with other countries of the world Japan ranks sixth in aggregate tonnage; France and Norway stand ahead of her, but by a small lead only.

"During many years past the growth of her home built tonnage has been fairly steady, while in purchasing from abroad periods of marked activity have alternated with slacker times. The third year after the Chinese war (1897) and the actual time of the Russian war were such periods of activity. Again in 1911 special circumstances prevailed and many ships were bought from abroad. Taking characteristic years the following table is interesting:

STEAMERS ADDED TO THE REGISTER IN VARIOUS YEARS

	1897		1900		1904	
	No.	Tons.	No.	Tons.	No.	Tons.
Built at home	57	10,698	53	15,308	114	27,500
Purchased from abroad.	22	67,454	13	28,492	72	177,298
	1907		1911		1915	
	No.	Tons.	No.	Tons.	No.	Tons.
Built at home	79	29,898	137	43,817	73	78,918
Purchased from abroad.	34	32,009	49	129,454	11	28,081

"At the present time construction at home is very active, indeed, and the number of steamers in hand exceeding 100 tons gross is 132, with an aggregate tonnage of 593,000 tons.

"The companies and owners holding the largest fleets (20,000 tons and more) are as follows, the last column indicating the subsidized routes upon which some of their principal vessels are employed:

Companies and owners—Principal subsidized routes.	No.	Tons.
Nippon Yusen Kaisha — Europe, North America, Australia, Bombay, Calcutta and some parts of China, etc.	92	424,090
Toyo Kisen Kaisha—South America, North America, Hong Kong.	10	84,918
Osaka Shosen Kaisha—North America, Bombay, domestic, some parts of China, etc.	56	152,594
Nisshin Kisen Kaisha—Inter China ports, especially about Shanghai and the Yangtse river	12	29,823
Okazaki Kisen Kaisha	9	23,124
Mitsui Bussan Kaisha	9	28,761
Kishimoto Shokwai	12	46,595
S. Nakamura	9	24,548
E. Hachi-uma	8	20,826

"The present subsidy law provides for transportation by companies whose shareholders are all Japanese subjects; the amounts paid in subsidy are based upon mileage actually completed, and upon tonnage, speed, and age; the steamers endowed must be of steel, of gross tonnage not less than 3,000, speed not less than 12 knots, and age not above 15 years; necessarily, they must also be upon the Japanese register. In 1915 the subsidies and bounties received by the various companies amounted to 7,129,204 yen; in 1914, 11,230,579 yen. Some time ago the Nippon Yusen Kaisha started running steamers through the Panama canal; leaving Yokohama, they took the Suez route to New York, and came back by the American canal. Interrupted for the time by the stoppage of transit the route will certainly be reopened later on. It is hoped that a government subsidy will be obtained for this Panama route; the competition upon it is so great that in normal times it is most difficult to make receipts balance expenditures there. Financial assistance in the matter of building is provided by another law; this was first promulgated in 1896, and by it a direct subsidy is given for the building of both hulls and engines.

"A subsidy that would about cover the extra cost of material in Japan as compared with Europe was aimed at and has been steadily maintained. Eleven to 22 yen per gross ton (according to type) and 5 yen per indicated horsepower developed on trial are the present figures for subsidy put in their crudest form; the granting of subsidies is qualified by some rather stringent regulations, which must be complied with by the works which entitle themselves to earn them. The law as last amended in 1910 has a period of life of 10 years from that date; under the amendment the minimum tonnage admitted to subsidy is 1,000 gross. From 1897 to the end of 1915 143 steamers, with an aggregate tonnage of 496,000, took advantage of these ship building encouragement laws; all the steamers now building are to benefit by the same means. The smallest tonnage of any ship participating was 727, the largest 13,400.

"The principal ship yards throughout the country are shown in the table below; this gives the number of steamers each has in hand at the present time and their aggregate gross tonnage:

	Steamers	
	No.	Gross tons.
Mitsu Bishi Dockyard & Engine Works Nagasaki	12	70,000
Mitsu Bishi Dockyard & Engine Works, Kobe	6	24,000
Kawasaki Dockyard Co., Kobe	24	139,000
Osaka Iron Works	44	201,000
Draga Dock Co.	15	61,000
Fujinagata Shipyard, Osaka	7	15,000
Ono Shipyard, Osaka	5	9,000
Ishikawajima Shipyard, Tokio	6	13,000
Yokohama Shipbuilding Co., (newly started)	6	47,000
Other ship yards	7	14,000

New American Built Steamer Sunk

The new Dutch steamer ANTWERPEN of 11,300 tons gross was sunk in the North Sea on Sept. 13. She was built at Newport News, Va., by the Newport News Shipbuilding & Dry Dock Co. She belonged to the American Petroleum Co., Rotterdam, Holland, and left Newport News in ballast on her maiden voyage for New York Aug. 24 and sailed Aug. 31 from Bayonne, N. J., for London on her first trip across the Atlantic.

ANTWERPEN, which was the first foreign ship ever built at Newport News, was in command of Capt. Herman Segebarth, who formerly commanded the oil tanker AMERICAN. She was 460 feet long, had a 60-foot beam, and was 30 feet in depth. The steamer was an oil burner and carried wireless apparatus. After the vessel was completed she was placed under American registry for 24 hours so that she could pass the steamboat inspection service requirements and get her papers. The following day the American flag was lowered and the steamship was transferred to Dutch registry.

Ships of Canadian register in Canada in the last fiscal year numbered 7,757, of which 4,132 are steamers.

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3,097,097 Tons of Ships Lost in War

Merchant Vessels Sunk as Result of European Hostilities Now Number 1,662—British Tonnage Represents Two-Thirds of Total

MORE than 3,000,000 gross tons of merchant shipping of all flags, types and classes have been destroyed as a result of submarine activities, floating mines and uncertain war causes during the period since hostilities opened. Records made up by *The Journal of Commerce* from all available data, including cable dispatches and mail advices, indicate that the number of merchant ships sunk or otherwise destroyed by the belligerents from the beginning of the war to Oct. 1, 1916, was 1,662, with an approximate aggregate gross tonnage of 3,097,097. Later reports may add to the figures of tonnage lost during September, owing to frequent delays in announcing the destruction of vessels and the inadequate cable service, but through the month of August the record is practically complete. Many ships that have been reported as lost have been included in the tabulation, although their tonnage was not listed in maritime registers. The statement of tonnage destroyed, therefore, is not excessive and probably less than the total lost.

Eleven flags were represented in the ship losses for September, the United States and Japan being the most important maritime nations to escape unscathed. The record of destruction for the month was 70 ships of an aggregate gross tonnage of 150,317. The number of ships was considerably below the figure for either July or August, but the tonnage was the largest in many months. The following table shows the number of vessels and the tonnage destroyed during each of the last five months:

	Number.	Gross tons.
September	70	150,317
August	100	130,262
July	145	102,522
June	64	126,369
May	63	118,994
Total	443	628,691

It will be seen that the rate of loss during the last five months has been approximately the average rate since the beginning of the war. Up to Oct. 1 the European conflict had been in progress just 26 months, during which time slightly more than 3,000,000 tons of shipping had been destroyed. The 628,691 tons lost during the past five months represent a fraction more than 20 per cent, whereas the time is something less than 20 per cent of the war period.

In August five nations lost six or more ships, while in September only Great Britain and Norway lost more than five. A feature of the month was the small number of Italian ships, whose destruction was reported, only four vessels of about 6,382 tons being sunk, as compared with 27 ships of 44,003 tons in August. A report is current that complete information as to Italy's losses is no longer available, as official statements are lacking. The average size of ships sunk in September was much greater than that of the vessels destroyed in August. Only 12 of the ships sunk last month were of less than 1,000 gross tons, whereas in the preceding month 49 vessels were under 1,000 gross tons.

Losses by Nations

Submarine activity in the Mediterranean sea was again marked, while there was a heavy increase in losses in the North sea and adjacent waters. The following table shows the distribution of ships lost according to flag during August and September:

	August		September	
	No.	Tons.	No.	Tons.
British	34	43,234	25	73,927
Norwegian	9	5,810	18	32,555
Dutch	2	3,167	2	11 762
Italian	27	44,003	4	6,382
Danish	4	6,507	4	6,211
Swedish	7	3,880	5	5,843
Greek	4	4,888	2	4,802
Spanish	2	6,348	2	4,274
German	1	1,028	1	2,050
French	6	2,324	4	1,078
Belgian	..	....	1	1,433
Japanese	2	6,524	..	....
Russian	3	1,549	..	....

Later reports have resulted in several corrections and additions to the list of August losses published previously, and these have been incorporated in the above statistics. The Russian steamer STEN II, of 227 gross tons, which was included in the tables for August, has since arrived in port safely. The Italian steamer ERIX, of 923 gross tons, was mistakenly reported as EUX, tonnage not recorded, and was so listed a month ago.

Additions to the August list are the Swedish steamer BALTIA, of 819 gross tons, sunk by a mine; and the Italian sailing vessels BALMORAL, of 2,542 tons; EURASIA, of 1,847 tons; LOUIS B., of 212 tons; ELIOS, of 190 tons; MARIA BRIZZOLAI, of 152 tons; TANNINA, of 138 tons, and IDA and RERINA PACIS, tonnage not recorded. All eight of the Italian boats were torpedoed.

Sixteen ships of more than 3,500 gross tons were sunk in September against only eight in August. The largest vessel destroyed was the Dutch steamer ANTWERPEN, of 11,300 tons. The following table shows the ships sunk, of 3,500 tons and upward:

	Gross tons.
Antwerpen, Dutch	11,300
Torridge, British	5,036
Counsellor, British	4,958
Swift Wings, British	4,465
Strathtay, British	4,428
Strathallan, British	4,404
Bronwen, British	4,250
Elizabeth IV, Norwegian	4,182
Polynesia, Norwegian	4,064
Lord Tredegar, British	3,856
Benpark, Italian	3,842
Llangorse, British	3,841
Dewa, British	3,802
Lexie, British	3,778
Swedish Prince, British	3,712
Heathdene, British	3,541

Some interesting changes in the ranking of the different nations, according to tonnage lost, have taken place in the last month. Great Britain still heads the list by a wide margin, contributing almost two-thirds of the total. In September the tonnage of British ships destroyed was almost equal to that of all other nations combined, and within a month British losses should almost reach 2,000,000 tons. Norway jumped ahead of Italy again, after being passed last month, and Norwegian losses now exceed those of Germany. Norway's losses now amount to 210,202 gross tons of shipping, and she is pressing France for second position. French tonnage destroyed now stands at 215,581 gross tons, French losses having been inconsiderable during the last two months. Italian losses exceed those of German, aggregating 198,277 tons to Oct. 1, and Italy holds fourth rank, while Germany has sunk to fifth position.

Teutonic shipping that has been lost as a result of the war is now less than half the losses of neutral nations. The following tables show the losses of each nation, of the allies, neutrals and Teutonic countries:

ALLIED SHIPPING DESTROYED

Nation—	Gross tons.
Great Britain	1,849,538
France	215,581
Italy	198,277
Russia	50,003
Belgium	27,291
Japan	22,539
Canada	3,464
Total	2,364,693

NEUTRAL SHIPPING DESTROYED

Norway	210,202
Holland	105,340
Sweden	58,465
Denmark	53,351
Spain	34,828
Greece	33,077
United States	12,671
Brazil	2,258
Total	510,192

TEUTONIC SHIPPING DESTROYED

Germany	189,778
Austria-Hungary	17,478
Turkey	18,150
Total	225,406

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Total losses of the principal nations to date, compared with the number of ships and the tonnage of its merchant marine, are indicated in the following table:

Flag—	Steam and sailing vessels owned according to Lloyds Register Book, 1915-1916 No.	Tons.	Gross tons of sail and steam vessels destroyed in war (26 months) No.	Tons.
Un. Kingdom.	9,285	19,541,364	873	1,849,538
British Colonies ...	2,068	1,732,700	1	3,464
*United States	2,580	3,522,913	7	12,671
Austro-Hungarian...	433	1,018,219	8	17,478
Danish	835	854,966	47	53,351
Dutch	809	1,522,547	49	105,340
French	1,539	2,285,728	99	215,581
German	2,166	4,706,027	77	189,778
Italian	1,177	1,736,545	108	198,277
†Japanese	1,155	1,826,029	6	22,539
Norwegian ...	2,174	2,529,188	152	210,202
Russian	1,256	1,054,762	44	50,003
Spanish	642	899,204	13	34,828
Swedish	1,462	1,122,883	61	58,465

*Excluding vessels trading on the Great Lakes of North America. †Japanese sailing vessels are not inserted in Lloyds Register Year Book and are therefore not included in these tables.

The number of sailing vessels reported as sunk during September was unusually small, only nine of the 70 being sailers, including two, the flag and tonnage of which is not recorded. The Norwegian steamer SETEDAL was first reported as a war loss, but investigation showed that her sinking was the result of a collision. A majority of the vessels whose names appear below are believed to have been destroyed by submarines, although not definitely reported as having been torpedoed. This fact would be substantiated by the German statements regarding the submarine activities. Claims of the Germans also involved the sinking of many fishing boats, the loss of which has not been reported by name or number, and these are, therefore, not included in the following tables, showing the ships of each flag sunk during September:

BRITISH MERCHANT SHIPS

Name and cause.	Gross tons.
Duart, submarine	3,108
Strathallan, sunk	4,404
Mascotte, sunk	1,097
Swift Wings, sunk	4,465
Kelvinia, mine	3,140
Torridge, sunk	5,036
Strathtay, sunk	4,428
Heatladene, sunk	3,541
Tagus, sunk	937
Llangorse, submarine	3,841
Butetown, submarine	2,466
Dresden, submarine	807
Bronwen, sunk	4,250
Thurso, sunk	1,244
Thelma, sunk	1,002
Strathe, sunk	2,500
Newby, sunk	2,168
Maywood, sunk	1,188
Rallus, sunk	981
Counsellor, sunk	4,958
Lexie, sunk	3,778
Swedish Prince, sunk	3,712
Roddam, sunk	3,218
Lord Tredegar, sunk	3,856
Dewa, sunk	3,802
Total, 25 ships	73,927

NORWEGIAN MERCHANT SHIPS

Name and cause.	Gross tons.
Gotthard, sunk	1,462
Rilda, submarine	313
Hiso, sunk	1,562
Lindborg, submarine	400
Furu, sunk	2,029
Frevadore, sunk	1,618
Lyderhorn, sunk	930
Elizabeth IV, sunk	4,182
Polynesia, sunk	4,064
Kong Ring, sunk	1,611
Losden, sunk	1,247
Bufjord, sunk	2,284
Vindeggen, submarine	2,610
Pronto sunk	1,411
Renteria, mine	1,602
Isdalen, sunk	2,275
Ethel, sunk	1,122
Tolosa, sunk	1,833
Total, 18 ships	32,555

MERCHANT SHIPS OF OTHER NATIONS

Name, nationality and cause.	Gross tons.
Seearend, Dutch, submarine	462
Antwerpen, Dutch, sunk	11,300
General Archinard, French s. v., sunk	461
Ariel, French s. v., submarine	...
Jeune Union French s. v., submarine	267
Stella del Mare, Italian s. v., submarine	1,166
Garibaldi, Italian s. v., submarine	1,374
Benpark, Italian, submarine	3,842
Nitnolo, Italian, submarine	...
Europe, French s. v., sunk	356
Marcel, Belgian, sunk	1,433
Johan Tillberg, Swedish sunk	401
Gamen, Swedish, sunk	2,617
Knut Hilde, Swedish, submarine	1,670
Dania, Swedish, submarine	467
Benguela, Swedish s. v., submarine	688
Jeanne, Danish, sunk	1,198
J. N. Madvig, Danish, sunk	1,762
Hans Jensen, Danish, sunk	1,825
Farmatyr, Danish, sunk	1,426
Luis Vives, Spanish, submarine	2,394
Mayo, Spanish, sunk	1,880
Elwine Koppen, German, mine	2,050
Assimacos, Greek, submarine	2,898
Spetzai, Greek, sunk	1,904
Adriana Jacoba (?), s. v., sunk	...
Noordster (?), s. v., sunk	...
Total, 27 ships	43,841

Tow Around the World

According to a recent issue of the *Standard Oil Bulletin,* the arrival of the Standard Oil Co. (California) steamer RICHMOND and barge S. O. Co. No. 95 in San Francisco, marked the completion of new history in ocean towing and also a record for this branch of the American merchant marine.

In 496 days, the time these vessels were absent from their home port, RICHMOND has towed barge S. O. Co. No. 95 for 75,000 miles, crossing the Atlantic and war zone 14 times, and on arrival had nothing to do but clean boilers and open up the main machinery for examination.

The longest no-stop tow was made between New York and Singapore (where the vessel stopped for bunker oil), a distance of 14,000 miles, and which was accomplished in 62 days, an average of 226 knots per day, or 9.4 knots per hour.

The superintendents, foremen and office men of the Cleveland and Lorain yards of the American Ship Building Co. held their annual clam bake at the Lorain yard on Sunday, Oct. 1. About 150 attended. The program was varied, the main event consisting of a ball game between the Cleveland and Lorain contingents. The Cleveland team was the victor.

Book Review

The Marine Steam Turbine; by J. W. M. Sothern; 555 pages, 6 x 9 inches; bound in cloth; published by the D. Van Nostrand Co., New York, and furnished by *The Marine Review* for $6 net.

This is the fourth edition of a most comprehensive work on the marine steam turbine. The new edition has several new sections which are devoted to discussions of entropy-temperature diagrams, geared turbines, oil fuel, auxiliaries and a number of subjects which are pertinent to the design and operation of turbines in marine work. The book is well illustrated and has a number of diagrams which are helpful in the study of turbines. Many tables of data taken from actual tests are included which serve to bring the theoretical discussions closer to the actual conditions. Another good feature of the book is that the problems illustrative of the text matter are fully worked out in conjunction with the discussion. The author points out in his preface that the marine reciprocating engine has taken nearly a century to arrive at its present state of mechanical perfection and economical efficiency whereas the marine turbine has arrived at a similar degree of efficiency within a brief period of less than three decades. Upon this assumption he predicts that the future holds many improvements in store for marine turbines which will be evidenced in greater flexibility and decreased steam and coal consumption.

Spain Limits Foreign Ownership

The Spanish government is considering the enactment of a law limiting foreign participation in Spanish maritime enterprises. According to the provisions of the bill laid before the Spanish parliament, the stock of a maritime joint-stock company held by foreigners shall not exceed 25 per cent of the whole capital. Partnership maritime companies will be obliged to submit to the director general of commerce the names of their members with the proportion each holds of the capital of the company; and that held by foreign members shall not exceed 25 per cent of the whole. Pending the passage of the bill, the Spanish government virtually made its provisions legal by means of a royal order. A period of two months was allowed for the reorganization of the companies in question.

The Atlantic Fruit Co. soon will resume steamship service between New Orleans and Frontera, Mexico.

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On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Delaware Bay is Booming Merrily

By Joseph Fenerty

THE Standard Oil Co. has purchased the two bulk oil steamers now under construction at the yard of the William H. Cramp & Sons Ship & Engine Building Co., Philadelphia. The price paid was $2,000,000. SUNOIL, one of the steamers, was launched recently, the other is still on the ways. Both were owned by the Sun Oil Co., Philadelphia. The Sun company was to have paid $800,000 each for the vessels. Both steamers are of similar design. They will each carry 10,000 tons of oil.

* * *

A new freight steamship line, to operate between Philadelphia and South American ports, has just been organized with a capital of $1,000,000. The first sailing will be on Oct. 15. The first ship will be bound for Rio de Janeiro and will touch at Santiago, Montevideo and Buenos Aires. A fleet of six steamers has been obtained. The company will be known as the Philadelphia & South America Steamship Co. and will operate the Philadelphia-South America line. It is being financed almost exclusively by New York capital although originally planned by the Philadelphia chamber of commerce. Monthly sailings have been arranged under the present schedule, but later, when the number of vessels is increased, bi-monthly sailings will be inaugurated. No passengers will be carried. The Pennsylvania railroad co-operated in the organization of the new company and the line will use the railroad's piers on the Delaware.

* * *

The work of raising the sunken steamship WASHINGTONIAN, off Fenwick island lightship, at the entrance to the Delaware capes, has been abandoned. The vessel was sunk about two years ago in a collision with ELIZABETH PALMER, a schooner. A preliminary examination showed that WASHINGTONIAN was lying on her side but failed to disclose the fact that her oil tanks were so seriously damaged that they were useless in aiding the wreckers.

* * *

The first keel at the yard of the new Pennsylvania Ship Building Co., Gloucester, N. J., has been laid. The completed vessel will be a 7,000-ton oil tanker. Officials of the company and of the city of Philadelphia, government marine inspectors and visitors from nearby ship building companies were present. Contracts for eight ships have been secured by the new concern. General Manager Henry Lysholm has said that the contracts secured will keep the yard in full operation for more than four years.

* * *

Lack of dry dock facilities at Philadelphia caused the owners of the British steamer ILFORD to have the vessel towed from the Port Richmond piers to Newport News, for extensive repairs. ILFORD was disabled in the Panama canal where her rudder was jammed. The only dry dock in the city, owned by the Cramp company, is engaged far into the future.

* * *

FANNY A. KIMBALL, schooner, which sailed from Santo Domingo, July 1, with a cargo of logwood for Chester, Pa., is missing. There is little doubt that the vessel foundered in the July hurricane. Captain Wall commanded the vessel, which was manned by a crew of seven. The schooner was consigned to A. B. Cummins & Co., and the cargo to the American Dyewood Co. KIMBALL was launched at Millbridge, Me., in 1906.

* * *

The ferry steamer, JOSEPH A. PARROTT, the second of three built by the William H. Cramp & Sons Ship & Engine Building Co., Philadelphia, for the Florida East Coast railway, has been successfully launched. The vessel will ply between Key West and Havana. The launching was witnessed by a party which included, in addition to a number of other prominent Cubans, Dr. Borlos Manuel de Cespedes, Cuban minister to the United States, and Senora de Cespedes, who was sponsor. Capt. Robert L. Russell, commandant of the Philadelphia navy yard, Mrs. Russell and R. W. Parsons, president of the railroad, were also present.

* * *

The license of Capt. Walter S. French, master of the Clyde line steamship DELAWARE, has been suspended for 90 days by the federal steamboat inspectors, port of Philadelphia, following the ramming and sinking of the barge DETROIT, in the Delaware river, off Philadelphia. At his trial, Captain French was found guilty of failing to maintain a proper lookout and of navigating his vessel at an excessive speed. It was also found that no whistle had been sounded to warn the barge of the course of the steamship. Captain French had never before been involved in a serious accident and this fact saved him from a more severe penalty.

Activity Stirs Great Lakes

By A. A. Eiben

EDWARD N. SMITH, formerly superintendent of the Buffalo Dry Dock Co., has been elected president of the Buffalo Dry Dock Co. and a director of the American Ship Building Co.

* * *

John F. Brinkman was recently elected secretary and treasurer of the Buffalo Elevating Association, to succeed the late John M. Bedford.

* * *

Capt. Henry Hinslea, Cleveland, master of the steamer J. B. COLGATE, will leave that vessel to bring out the 600-foot steamer SIR TREVOR DAWSON, building at the Superior yard of the American Ship Building Co. for the Canada Steamship Lines, Montreal.

* * *

Capt. Robert N. Bailey, a well-known ship master on the Great Lakes, died at his home in Toledo Sept. 28.

* * *

Capt. R. D. Peltier, master of the steamer WILLIAM F. FITCH, will bring out the new steamer H. F. BLACK, building for the Donner Steamship Co. at the Lorain yard of the American Ship Building Co. This promotion will cause several changes in the Hanna fleet. Capt. George Levis, master of the steamer R. S. WARNER, will be in command of FITCH, Capt. S. Brines of the barge ALEX. MAITLAND will sail WARNER, and William Witte will be transferred to MAITLAND.

* * *

The steamer THORJERD, building for Norwegian interests, was recently launched from the yard of the Western Dry Dock & Ship Building Co., Port Arthur, Ont. THORJERD is 261 feet long, 43½ feet beam and 28 feet 2 inches deep, and is the first ocean-going vessel to be built at the Port Arthur yard. BALAMYA, a sister ship, now on the stocks, will be launched about Oct. 20.

* * *

The steamer FRANCIS WIDLAR, purchased by W. H. Becker from the Columbus Steamship Co., has been placed in the fleet of the Valley

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Steamship Co., which is operated by Mr. Becker.

* * *

The wrecker FAVORITE has resumed work on the steamer WESTERN STAR, which stranded at Robertson rock, Georgian bay, last season. The bulkhead, built around the after end of the vessel last winter, collapsed when an effort was made to lift her.

* * *

In connection with the case of the Pittsburgh Coal Operators' Association against the Pennsylvania Railroad Co. and others, regarding lake cargo coal rates, the interstate commerce commission recently sent out requests for information tending to show operating conditions in relation to shipments of lake cargo coal over representative routes from the principal bituminous coal producing districts in the territory embraced in the investigation, to lower Lake Erie ports. The Hocking, Cambridge No. 6, Fairmont, Kanawha and Pocahontas territories are named by the commission as those from which information is desired.

* * *

Capt. C. H. Westcott, supervising inspector of steamboats in the Detroit district, recently reversed the decision of the local inspectors at Marquette, Mich., who suspended the license of Capt. W. W. Durkee, of the steamer J. B. NEILSON, for 30 days, as a result of a collision between NEILSON and the steamers CHARLES L. HUTCHINSON and LYMAN C. SMITH. Captain Durkee's license was restored.

* * *

The new freighter building at the Lorain yard of the American Ship Building Co. for the Pittsburgh Steamship Co., will be launched shortly.

The Mississippi Delta

By H. H. Dunn

THE J. G. Rainwater Co. has bought the steamer SAN RAMON as a result of the award to the company of contracts for 17,000,000 feet of lumber for Panama canal buildings. SAN RAMON will carry 1,250,000 feet of lumber each trip to the Canal zone.

* * *

George R. Thompson, foreman of the government ship yard on Lowry island, off Biloxi, Miss., since its establishment two years ago, has resigned and has been succeeded by Arthur Allen, Mobile, Ala.

* * *

The steamers CORINTO and HARALD were put into service between New York and Nicaragua in September, by the Bluefields, Fruit & Steamship Co. CORINTO has been plying between gulf ports and Central America for 12 years for the United Fruit Co., while HARALD has been hauling sisal fibre from Progreso to New Orleans, carrying foodstuffs back to the Mexican port for some time, for the New York & Porto Rico Steamship Co. Heavier demand for bananas and other tropical fruits is said to be the cause of the change.

* * *

Navigation on the Black and Ouachita rivers in Mississippi, is practically closed because of the formation of a sand bar across the mouth of the Black river. The steamer S. L. ELAM, New Orleans, was held on the bar for 24 hours.

* * *

Resurvey of the Mississippi, Alabama and Louisiana coasts, and Mississippi sound, probably will be made soon, on account of the shifting of bars and shoals, and the creation of a number of new, small islands, during the storms of the past year.

* * *

The Texas-Louisiana Navigation Co. has restored traffic between Moringsport, La., and Jefferson, Tex., by way of Caddo lake and the bayous of east Texas. Service is maintained by means of SENATOR SHEPPARD, a 60-horsepower gasoline boat. Capt. G. H. Lee has laid plans to establish a boat line between Shreveport, La., and Moringsport as soon as a channel, now being dug, is opened.

* * *

Aktieselskabet Korn og Foderstof Kompagniet, a corporation dealing in corn and fodder at Aarhus, Denmark, has seized the steamer LILY, property of Aktiebolaget Kattegat and Herm Swensson, Helsingborg, Sweden, on an order from Judge Rufus E. Foster of the federal district court in New Orleans. The action is taken on a claim for $48,351.60 damages alleged to have been incurred as a result of the Swedish corporation's failure to have the steamer SIGNE at Galveston, New Orleans, Mobile or Pensacola, to receive a cargo of 3,700 tons of cotton-seed cake that the Danish company declares was agreed upon.

* * *

Another American vessel changed flags recently in New Orleans when the big auxiliary schooner OSCAR G., belonging to the American Fruit & Steamship Co., took on Nicarauguan registry. Her agents claim the step was taken to escape the rigors of the American maritime regulations.

* * *

Charles Dittman, Stonewall Jackson and Louis N. Gould, coffee importers, New Orleans, recently participated in conferences with the managers of the Lloyd Braziliero Steamship Co., to try to establish direct New Orleans-Brazil steamship service. Semi-official information received in New Orleans indicated that the Lloyd company would establish the service. For some time, Chicago and St. Louis exporters and importers have been trying to persuade the steamship company to make connections that would give the manufacturers west of New York a chance to do business with South America on an equal footing with those of the Atlantic seaboard. The freight differential is in favor of the line from the Gulf ports, but, aside from the Munon line service from Mobile to the River Plate, there are no adequate sailings.

* * *

The Gulfport Transportation Co. has filed a libel against the steam tug HARSTEEL, owned by the J. H. W. Steele Co., Galveston, for $50,000 damages. The transportation company alleges that the Steele company failed to carry out a contract for the towing of barges from Gulfport to Tampico, Mexico.

* * *

Capt. O. J. Perkins, of the Standard Oil Co.'s steamer PADDOCK, who recently was shot by a discharged cook, will recover.

* * *

The steamship TUDDAL left New Orleans in September laden with 119,100 sacks of sugar for the allied armies in France. She cleared for Havre.

* * *

The Mexican Fruit & Steamship Co., New Orleans, John Beninato, manager, has added another steamer to its fleet. The new ship, OLYMPIC, formerly of San Francisco, will ply between the Crescent City and ports of Cuba and Mexico. She will replace MARY G. DANTZLER, the four-masted auxiliary schooner which was lost during the hurricane of July 5. The steamer is now bound from San Francisco to Balboa, with a lumber cargo. After a trip to New York she will come to New Orleans, arriving there about Oct. 20. OLYMPIC is 185 feet long, 38 feet beam and 15 feet draught. She is built of wood and steel and is equipped with 750 horsepower engines which give her a speed of 11 knots. The vessel was built for a lumber carrier, having a capacity of 800,000 feet, and is an ideal ship for tropical waters. The Mexican Fruit & Steamship Co. was organized by New Orleans' capital about a year ago, to purchase ships to replace those withdrawn from Latin-American trade by the European war. The addition of OLYMPIC will give twice-a-month service between New Orleans and the ports of the southern republics.

* * *

Inability of the Southern Pacific and other railroads in Louisiana to supply empty freight cars to move the huge rice crop to New Orleans this year, has led the Louisiana State Rice Milling Co. to take steps to transport its crop entirely by boat. The steamer PATRICIA and a long string of barges have been chartered to carry clean rice from Abbeville, Bayou Vermillion and Morgan City to New Orleans. There are also 12,000 bags of rough rice to be carried to the mills. Sugar planters and lumber men also are in the market for boats to handle their products. Never since 1880 has there been so great a demand for river craft.

* * *

The Home Industry Iron Works, Mobile, Ala., has secured contracts for repairing the Norwegian bark ANCENIS at Mobile and the American steamer MEXICO at New Orleans. About $35,000 will be spent on MEXICO and $50,000 on ANCENIS. The dismasted bark AVENGER will be repaired by Harrison Brothers at Mobile.

On the Chesapeake

By Hollis F. Bennett

The American-Hawaiian steamship GEORGIAN upon her arrival in Baltimore recently completed a round trip of approximately 39,800 miles. GEORGIAN, leaving Baltimore last Janu-

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ary, made the following ports: San Francisco by way of the Straits of Magellan; Honolulu, two ports in China and two in Japan, then to Pagoumne, New Caledonia, where she loaded 8,000 tons of chrome ore for her return voyage. After discharging, GEORGIAN dry docked and was sold to Norwegian owners for a sum reported to be close to $2,000,000.

* * *

The Baltimore Dry Docks & Ship Building Co. has completed two collision damage jobs in record time during the past month. The steamship GRAYSON, which collided with the Dutch steamship PARKHAVEN had a new stem and 22 bow plates renewed in nine working days and the Norwegian steamship SORLAND, which collided with the steamship BRUNNEL, in the River Humber had a new stem and 24 plates fitted in 10 working days.

* * *

The oil tank motor ship RALPH BULLOWA was launched by her builder, the Baltimore Dry Docks & Ship Building Co., Sept. 17. RALPH BULLOWA was christened by Miss Laila Nortone, Philadelphia, and is the second of four motor-driven oil tankers building for Christopher Hannevig. The first of these tankers, BRAMMELL POINT, was purchased by the Vacuum Oil Co. and will have her finals late this month.

* * *

The Andes Copper Co. has purchased the Baltimore & Carolina Steamship Co.'s steamship ELIZABETH WEEMS, formerly the Norwegian steamship ANITA, which was wrecked on the east coast of Florida and brought to Baltimore for repairs. ELIZABETH WEEMS is 1,118 gross tons, 224 feet long, 33.7 feet beam, 19.1 feet depth and was built in Christiana, Norway, in 1906. The new owners will use ELIZABETH WEEMS in coasting service between their mines on the west coast of South America.

Boston Harbor

By Geo. S. Hudson

A fleet of steamers designed primarily for the coal carrying trade is being built by the Darrow, Mann Co., Boston. The first ship, TIDEWATER, 9,000 tons, will be launched in November at Camden, N. J. DEEPWATER, capacity 12,500 tons, will be put overboard early next year. The company has just placed the steamer CORSICA, built on the lakes, in the coastwise service.

* * *

The cup defense sloop, JUBILEE, built for Gen. C. J. Paine, has been sold into merchant service and will be altered into a coal schooner with capacity of about 200 tons. JUBILEE'S 40-ton lead keel has been sold for junk. The vessel was laid up 12 years at Marblehead, Mass. She will be commanded by Capt. Edward Joyce, formerly of the three-masted schooner JAMES SLATER.

* * *

The Coastwise Transportation Co., Boston, has entered into a 5-year charter with Philadelphia parties for the steamer SUFFOLK at $480,000 per year. The vessel will be used to carry coal from Chesapeake bay to Buenos Aires, returning to Philadelphia with manganese ore.

* * *

The two-masted schooner, MARGUERITE, Captain Gayer, has been abandoned to underwriters after having been sunk in Boston harbor, September 9, by the steam lighter EUREKA.

* * *

The Boston bark WINDRUSH will receive $40 per 1,000 feet for a cargo of 1,350,000 feet of white pine and spruce lumber from Boston to Buenos Aires. This is said to be the largest freight rate reported since the war. In normal times $8 was considered worth while.

* * *

The steamer EDWARD LUCKENBACH, largest of her type ever built in Massachusetts, has been launched by the Fore River Ship Building Corporation for the Luckenbach line, New York. The ship is 437 feet long, 60-foot beam, with capacity of 10,000 tons dead weight. The ship will load general cargo at New York for Australia.

* * *

Capt. Robert Linklater, connected for years with the Bucknall Steamship Co., London, master of the steamship KANSAS, died at Colombo last month. Captain Linklater was well known in Boston and New York shipping circles.

* * *

Nova Scotia parties have purchased the two-masted schooner GEORGETTA LAWRENCE from J. C. Wilson, Bangor, Me. The vessel was built in 1869 at Brookhaven, N. Y.

Around Puget Sound

By F. K. Haskell

THE Vancouver Shipbuilding Co. has been incorporated at Vancouver, Wash., by James Feeney, Feeney & Bremmer, contractors and boat builders. Associated with him are Hohn Steinback and R. C. Percival. The company is capitalized for $25,000 and soon will build a modern ship building plant with ways for constructing five wooden vessels. Enough business has already been offered to keep the plant working at full capacity for a year.

* * *

E. P. Erckenbrack, for the past two years assistant manager of the Border Line Transportation Co. and one of the best known of coast steamship men, has been appointed manager of the company with headquarters in Seattle, Wash. He succeeds A. F. Haines, who joins the Pacific-Alaska Navigation Co. in a similar capacity.

* * *

The steam tug IVERNESS was launched during the past month at Eagle Harbor, Wash. The vessel, which is 65 feet in length, has engines rated at 200 horsepower and will be used for general towing in southeastern Alaska.

* * *

Important schedule changes for the Admiral line vessels have been announced by the Pacific-Alaska Navigation Co. The changes are due directly to the growth of Alaskan freight business, the offerings being so plentiful that many of the steamers were delayed through pressure of work. The sailing dates have been arbitrarily set ahead so that the regular schedule may be resumed.

* * *

In preparation for a still larger increase in oriental trade via the Seattle gateway, the Nippon Yusen Kaisha, Japan's greatest shipping corporation, has decided to increase its Seattle office force by the transfer of clerks from Kobe and Tokio. As the result of the inauguration of steamship service to the Atlantic coast via the Panama canal the company has decided to open its own office in New York City.

* * *

The famous old cruiser BOSTON, which took part in the battle of Manila, is to be stripped of her equipment at the Puget sound navy yard, and sold to the highest bidder. BOSTON was conveyed from the mouth of the Columbia river up the coast by the cruiser NEW ORLEANS.

* * *

Two big carriers of the Harrison Direct line, the British steamships CROWN OF SEVILLE and CROWN OF TOLEDO, cleared from Puget sound during the month bound for Liverpool. SEVILLE carried upward of 3,000,000 feet of lumber and 750 tons of canned salmon.

* * *

A banquet complimentary to the ship builders of the northwest who are responsible for the ship building revival on Puget sound was held during the month at the Washington hotel, Seattle, Wash.

* * *

Capt. Peter Jordan, vice president of the Callendar Navigation Co., Astoria, Ore., and for 34 years a shipping man on the lower Columbia river, died recently. Captain Jordan was born in Ohio in 1857.

Anchor Maneuvers

(*Continued from* 383.)

porary orlop deck was constructed with a raised level of 3 feet from the ship's skin. In three hatches there were already pyramids of ore, when an earth and seaquake paid us a visit. The bottom of the bay was considerably disturbed as the soundings after the quake clearly proved, but the first announcement that we had was the rumbling of the anchor chains, sufficient to cause our ship to roll gently and sheer about. In the cargo holds the pyramids of loose ore were gradually leveled down by the tremor, while loose articles about the decks and cabins had the true fandango instinct of all Spanish colonies.

Should you be riding out a heavy gale with both head anchors down and all chain out, go into the chain locker and rack both chains together, say 6 feet below the guide pipes of the windlass. Then should it come to the worst, if the gypsy or brake gives out, your vessel will not be driven ashore.

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Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

ORDERS totaling more than $2,700,000 recently were taken by the Westinghouse Machine Co., East Pittsburgh, Pa., for equipping 44 merchant ships now under construction or contracted for at the yards of ship building companies on both the Atlantic and Pacific coasts with Westinghouse propelling machinery. The company also has in immediate prospect the equipment of 16 merchant ships in addition to the 44 above mentioned, bringing the total number of ships up to 60 and the total value of the orders for machinery to be supplied by the Westinghouse Machine Co. to approximately $3,750,000.

The ships are to be equipped with the latest refinements in the way of propelling machinery, consisting of Westinghouse turbines with double reduction gears, and with few exceptions, condensing equipment. The first ship which has been so equipped is MALMANGER, launched by the Chester Shipbuilding Co., Chester, Pa., on Aug. 26, 1916. This business covers strictly merchant ships and does not include orders received for propelling machinery for the United States navy, or for foreign governments.

Tobin Bronze

The American Brass Co., Ansonia, Conn., has issued a 35-page booklet describing Tobin bronze, which is used extensively for marine purposes. The booklet includes physical data regarding the composition and strength of Tobin bronze, together with instructions for its proper forging and working. Data on torsional tests and corrosive tests, together with other interesting information also are included in the booklet.

Valves for Marine Work

A lever-operated, rotating-disc valve described in a catalog recently issued by the Scully Steel & Iron Co., Chicago, is said to be particularly suitable for marine service on purifiers, ash guns, and blow-downs on water columns. The valve is made up of a top and bottom bonnet, a disc and a lever and post. The two bonnets are set together on a high-pressure gasket with machine bolts, giving easy access to the interior in case it should be necessary to renew the disc or to reface the seat. A wrench is used to operate the valve; the effort to open the 2-inch valve against 200 pounds pressure is about 25 pounds on an 8-inch lever. The operating post is held to its seat by a stiff bronze spring to prevent any leakage at this point. The clearance spaces within the valve are of liberal proportions and are said to prevent clogging even under the most adverse conditions. These valves are made in a variety of sizes and are designed for use under all conditions requiring a quick opening and closing valve.

Bolinder Oil Engines

The Bolinders Co., 30 Church street, New York, has issued an unusually complete catalog, describing clearly its heavy-oil engines. This engine is a two-cycle, hot-bulb, heavy-oil engine, which runs on heavy crude or residue fuel oil and on kerosene.

The engine works on what is known as the two-cycle principle, that is, one impulse to each revolution. When the piston at the end of its outward stroke is moving in toward the ignition chamber, the necessary air for scavenging and combustion is drawn through air valves into the enclosed crank case, and at the same time the air in the cylinder is being compressed. When the piston has reached its extreme inward position, a certain amount of oil is injected into the ignition chamber through a nozzle, and the fuel charge ignites, resulting in the expansion of the gases driving the piston outward toward the shaft. During this outward stroke of the piston the air in the crank case is compressed. As the piston nears the end of its stroke, the exhaust port opens, and immediately afterward the inlet air port. The burned gases escape through the exhaust port, while the compressed air in the crank case entering the cylinder by the inlet air port completes the scavenging work, and furnishes the cylinder with air necessary to make up the next charge in the cylinder.

The direct reversible engines are made in sizes ranging from 5 to 500 brake-horsepower and are suitable to propel any kind of craft. They have been adopted in passenger ships, big cargo ships, lighters, barges, tugs and pleasure launches, and owing to their simplicity and size, are peculiarly adaptable as auxiliaries in large sailing vessels. The design and operation of these engines is explained and full particulars are given of the different models manufactured by the Bolinders Co. It is pointed out that 400,000 brake-horsepower of Bolinder engines are now in use in all parts of the world, while the present yearly output is 70,000 brake-horsepower. An interesting feature of the catalog is the presentation of a large list of American and foreign installations of Bolinder engines.

Statement of Ownership and Management

Statement of the ownership, management, circulation, etc., required by the act of Congress of Aug. 24, 1912, of *The Marine Review*, published monthly at Cleveland, O., for October. 1, 1916; state of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared A. O. Backert, who, having been duly sworn according to law, deposes and says that he is the business manager of *The Marine Review*, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The Penton Publishing Co., Cleveland, O.; editor, H. Cole Estep, Cleveland, O.; business manager, A. O. Backert. 2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.) John A. Penton, Cleveland, O.; A. O. Backert, Cleveland, O.; R. E. Power, Cleveland, O.; G. W. Hotchkiss, Cleveland, O.; O. P. Letchworth, New York, N. Y.; W. B. Ullman, Chicago, Ill. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. (Signed) A. O. Backert. Sworn to and subscribed before me this 27th day of Sept., 1916. E. S. Hanson, Notary Public. (My commission expires Feb. 8, 1918.)

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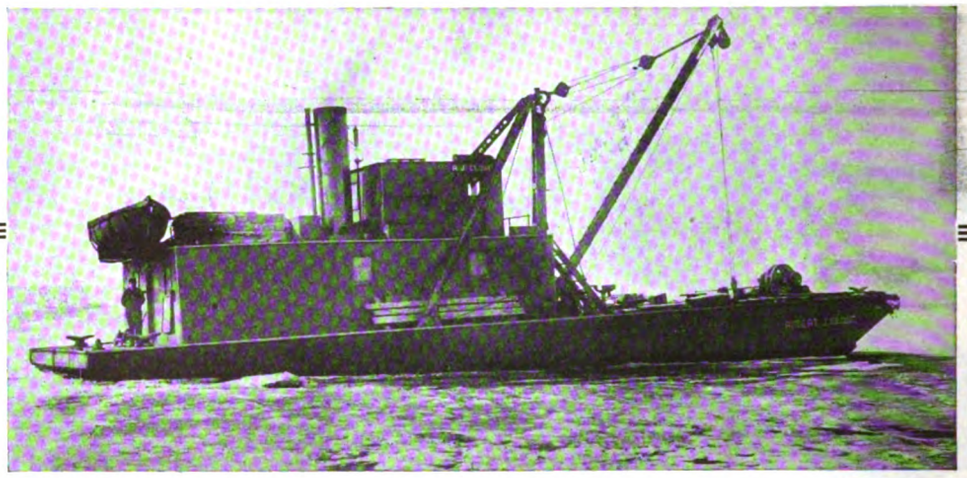

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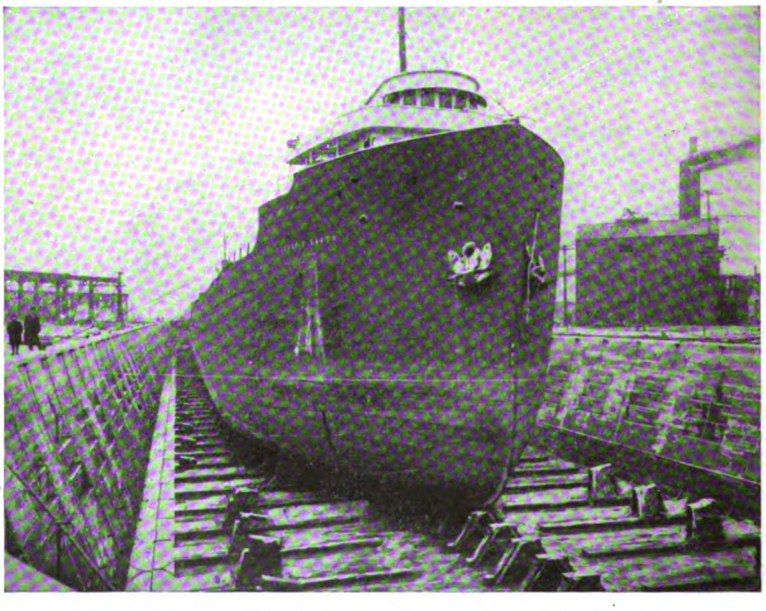

Steamer George F. Baker in Our New Concrete Dock at South Chicago

Dimensions of Dry Dock

	Feet
Length -	734
Width:	
At Top -	103
At Bottom -	88
Depth -	22½

We Operate the Largest Graving Dock on Lake Michigan
Complete Facilities for Rapid Repair Work
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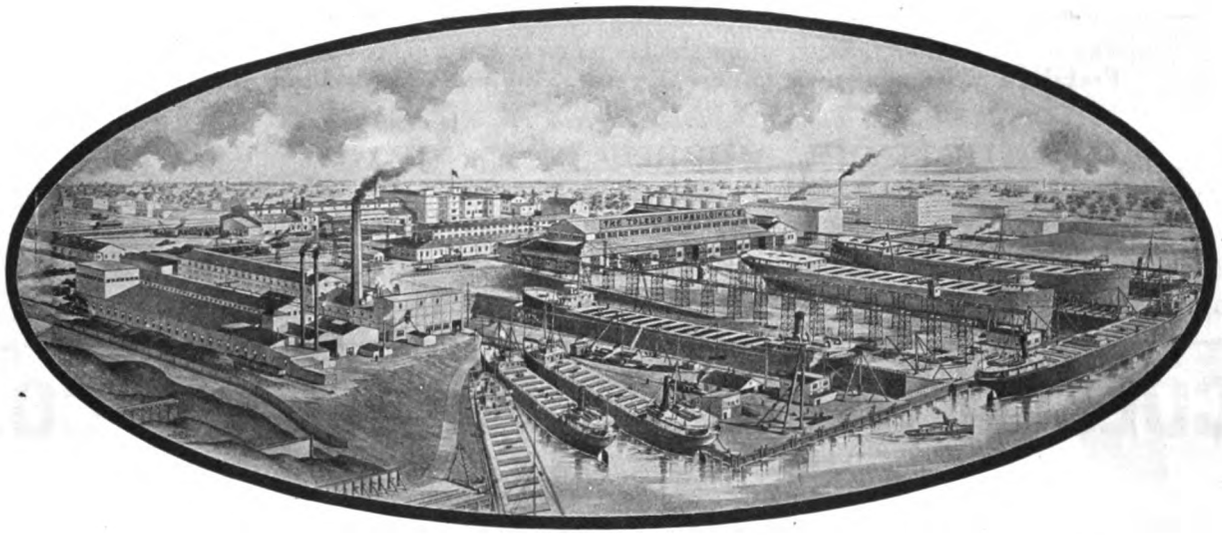
The Toledo Shipbuilding Company

TOLEDO - - - OHIO



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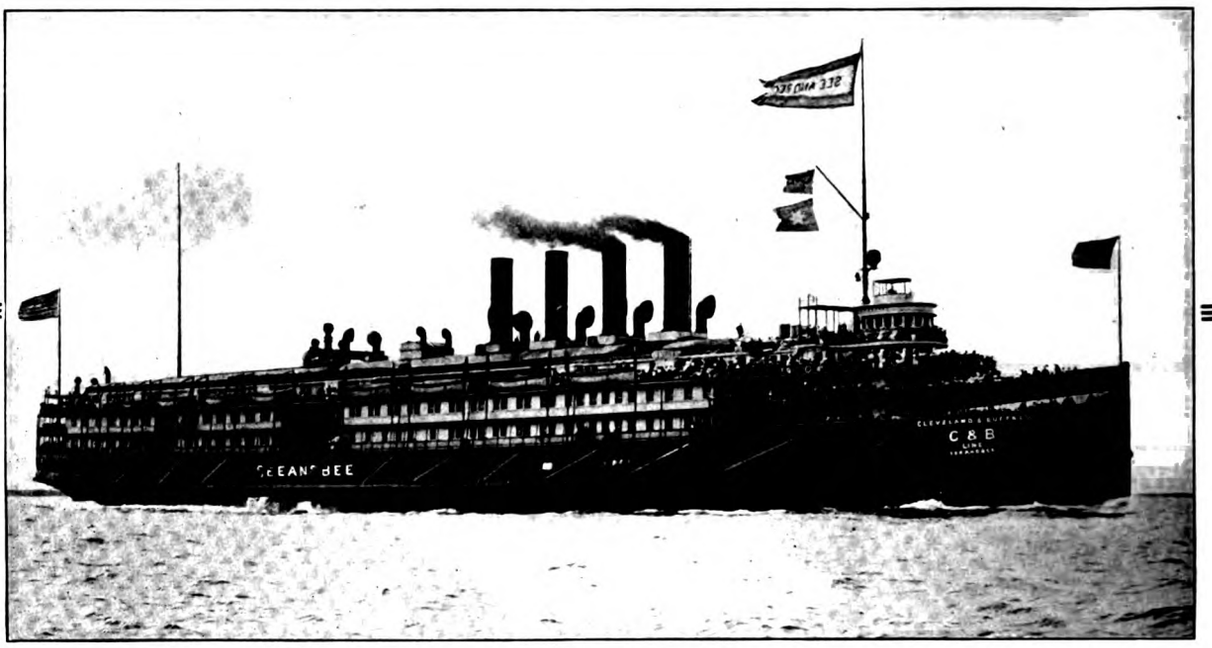

BUILDERS OF **"SEEANDBEE,"** LARGEST SIDE WHEEL STEAMER IN THE WORLD. Designers and builders of all types of

Freight and Passenger Steamers, Engines, Boilers and Auxiliary Machinery

Manufacturers of BRASS MARINE HARDWARE and BRASS SPECIALTIES.
Builders of *Metallic Life Boats* and *Clark Patent Metallic Life Rafts.*

DETROIT SHIPBUILDING COMPANY

M. E. Farr, Pres. and Treas. E. Ketcham, Secretary Frank Jeffrey, Gen. Supt. John D. Langell, Supt. of Dry Docks and Repairs

Established 1852

Steel Shipbuilding Plant at Wyandotte, Michigan. First-class equipment for making hull and machinery repairs.

Dry Docks, Machinery Works and General Offices, Foot of Orleans Street

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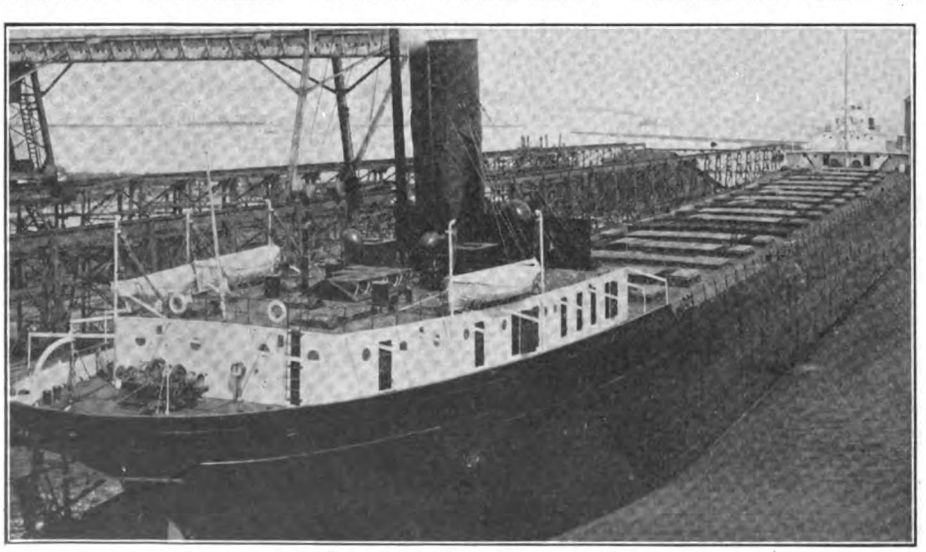
COLLINGWOOD SHIPBUILDING CO.

LIMITED

COLLINGWOOD—ONTARIO—CANADA

STEEL and WOODEN SHIPS, ENGINES, BOILERS, CASTINGS and FORGINGS

PLANT FITTED WITH MODERN APPLIANCES FOR QUICK WORK



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SYSTEM

OF

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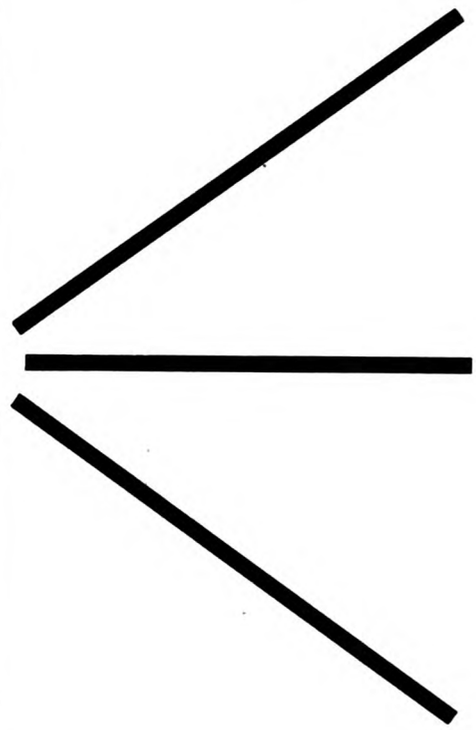
Experience has proved that this system gives increased strength, increased cubic and deadweight capacity, reduced cost of maintenance, and reduced vibration at no greater first cost than a vessel of similar dimensions built on the transverse system.

Owners who are contemplating the construction of new vessels, of any type whatever, will find this system of construction most advantageous and suitable for all trades.

580 vessels of all types and sizes, representing about 4,466,000 tons deadweight carrying capacity, have been built or are now on order, including a good many repeat orders from owners who have tried the system.



J. W. ISHERWOOD,

17 Battery Place
NEW YORK CITY

Head Office, 4 Lloyd's Avenue
LONDON, E. C.

Tel. Number:
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Tietjen & Lang Dry Dock Co.

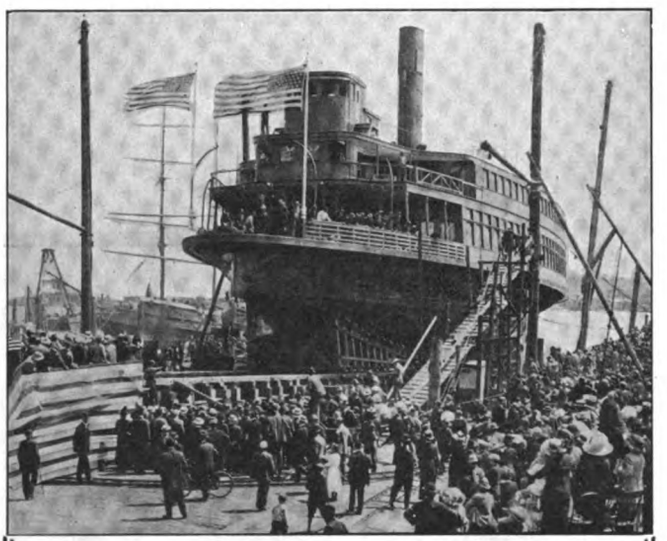
HOBOKEN, N. J.

NINE DRY DOCKS

General Repairs on Wooden and Iron Vessels

FT. OF 17th STREET

Telephone 700 Hoboken HOBOKEN, N. J.



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Engineers and Ship Builders

SAN FRANCISCO, CAL.

MODERN MARINE BOILERS

and

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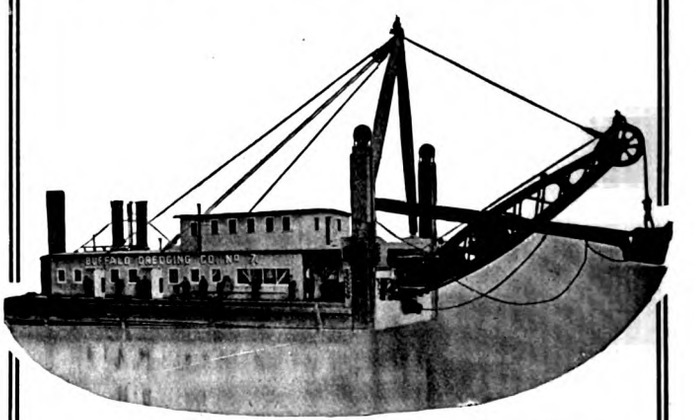

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JOHNSTON BROTHERS

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Milwaukee Dry Dock Company

Milwaukee, Wisconsin

Ship Repairs of All Kinds

ALSO MACHINE SHOP FOR ENGINE REPAIRS

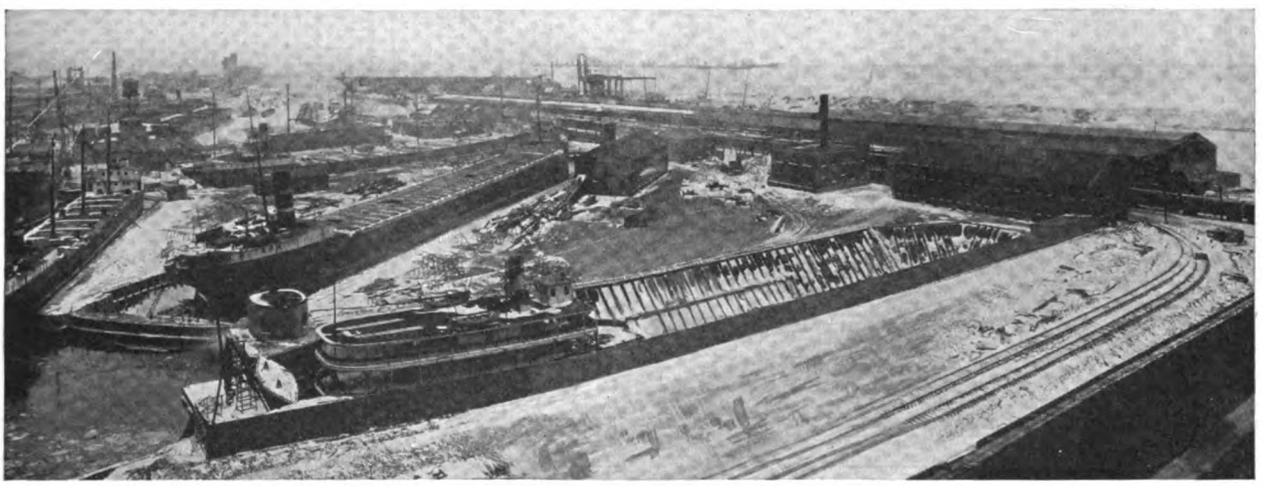
Steamer "Charles Horn" in Dry Dock

We have two shipyards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 feet long on keel blocks; 460 feet over all; 60 feet width of gate and 16 feet over sill. West Yard Dock is 312 feet on keel blocks; 45 feet width of gate and 12 feet over sill. Rudder pit in each dock. Electric light for night work.

Main Office at South Yard
Foot of Washington Street

Residence Phone
F. W. Smith, Manager
Lake 467

Telephone—Hanover 3
West Yard—Hanover 2555



The Buffalo Dry Dock Company

BUFFALO, N. Y.

With our excellent equipment we are enabled to do all kinds of ship repairs at reasonable cost to the owners, whose patronage is solicited with the guarantee of satisfaction in all particulars.

EDWARD N. SMITH, Superintendent **WILLIAM KNIGHT, Ass't Sec'y and Treas.**

Office Telephone, Bell, 4055 Seneca; Federal, 22-531

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LARGEST FLOATING DRY DOCK EQUIPMENT ON THE PACIFIC COAST

Completely Equipped Shops for Ship, Engine and Boiler

REPAIRS

Ship Builders, Engine Builders, Boiler Makers, Iron Founders, Brass Founders, Lumber Manufacturers

PARSON'S MARINE STEAM TURBINES—YARROW BOILERS

Cable Address: "THREEDOCKS"—Codes: Western Union, A. B. C., 5th ed. and Bentley's

Seattle Construction & Dry Dock Company

SEATTLE, WASHINGTON

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Designers and Builders of

Steel Passenger Boats
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Floating Cranes
Lighters
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Tugs
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Marine Engines
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Facilities for prompt and economical repairs

MANITOWOC, WISCONSIN

BATH IRON WORKS

LIMITED

BATH, MAINE

Shipbuilders and Engineers

Licensee for
Parson's Marine Turbines,
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Particular Attention Given to
High Speed Requirements
Estimates Furnished.

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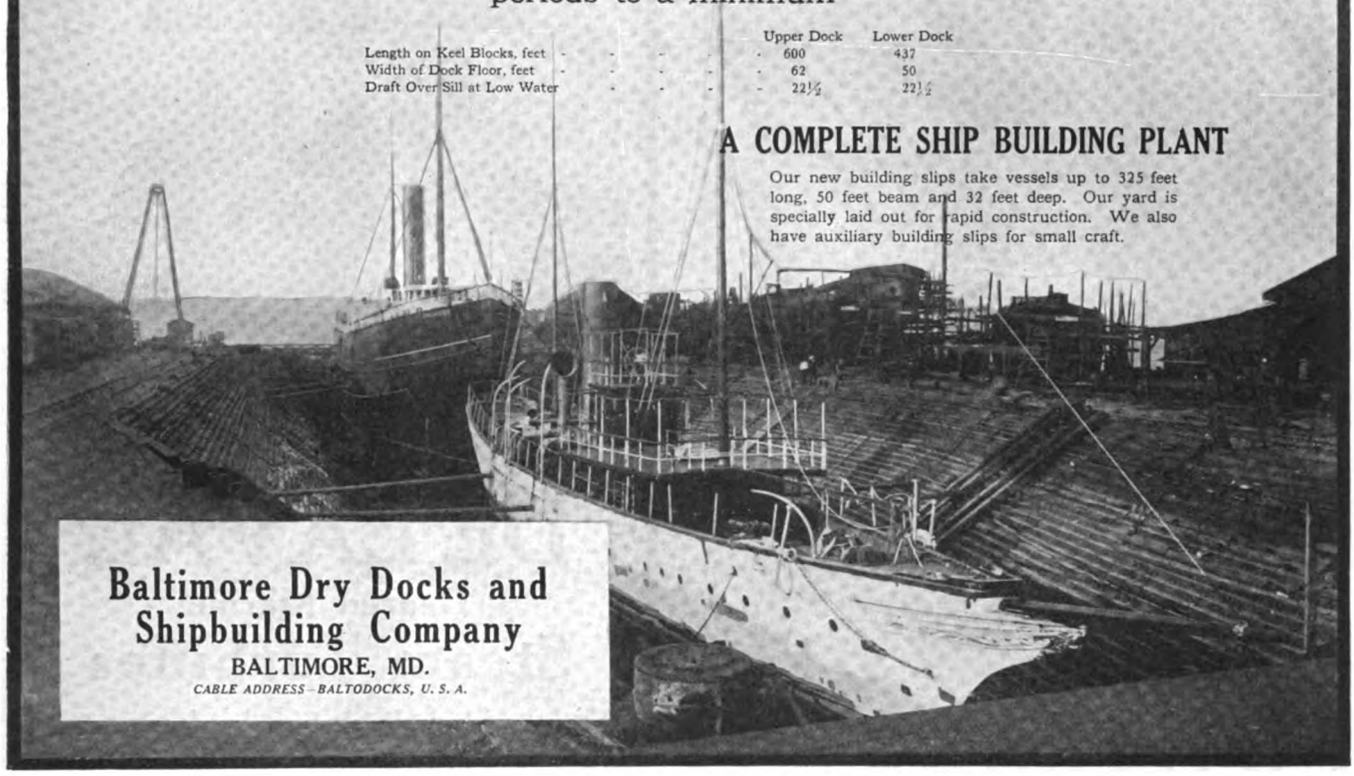
OUR DRY DOCKS SAVE TIME

Two Docks, coupled with Complete Shop Facilities, cut repair periods to a minimum

	Upper Dock	Lower Dock
Length on Keel Blocks, feet	600	437
Width of Dock Floor, feet	62	50
Draft Over Sill at Low Water	22½	22½

A COMPLETE SHIP BUILDING PLANT

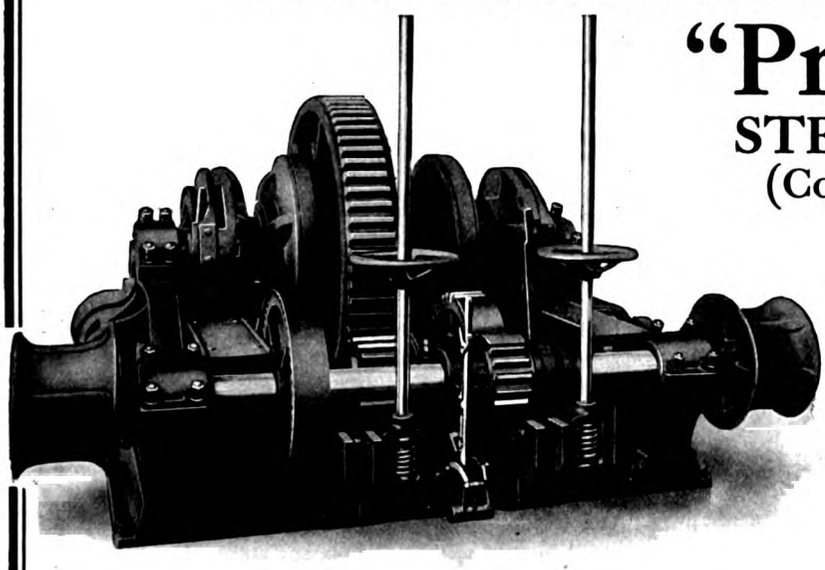
Our new building slips take vessels up to 325 feet long, 50 feet beam and 32 feet deep. Our yard is specially laid out for rapid construction. We also have auxiliary building slips for small craft.



Baltimore Dry Docks and Shipbuilding Company
BALTIMORE, MD.
CABLE ADDRESS—BALTODOCKS, U. S. A.

"Having a PULL means having a friend in power who will act as a steam windlass for you." The

"Providence"
STEAM WINDLASS
(Compound Spur Gears)



has another kind of *pull*, and plenty of it. It has 15 per cent more *pull* than the worm-geared types and at 50 per cent faster speed. You have been looking for just this combination. Our price will please you, too.

Write us today.

AMERICAN ENGINEERING COMPANY
SUCCESSORS TO AMERICAN SHIP WINDLASS CO. AND WILLIAMSON BROS. CO.
MACHINISTS AND FOUNDERS
PHILADELPHIA

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Next to actual experience with it in service the best evidence of its superiority is the constantly increasing demand for our product.

In buying Waterbury Cordage as well as other Waterbury Products, you are assured of as high a quality as it is possible to make.

We shall be pleased to send you a copy of our new Cordage Catalog.

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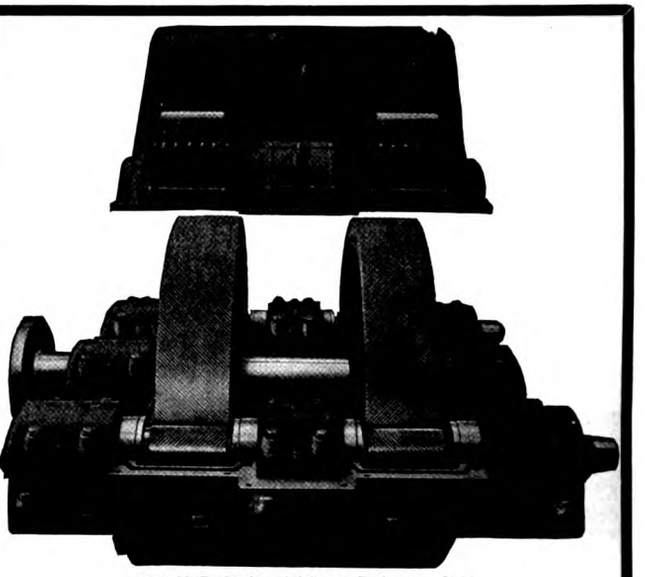
NEW ORLEANS, 1018 Maison Blanche Bldg.....Canal and Dauphine Sts.
Wire Rope, Fibreclad Wire Rope, Armored Wire Rope.



4500 H. P. De Laval Marine Reduction Gear

Use

DE LAVAL

Geared Marine

Steam Turbines

The double-helical speed-reducing gear for steam turbine service was first introduced by De Laval in 1894.

At present over 6500 De Laval Double-helical Speed-Reducing Gears are in successful operation.

De Laval Gears are built by highly skilled workmen, from the best materials, and with equipment developed and improved by over 20 years of experience.

All factors entering into the design have been chosen after long experience under practical operating conditions, and all parts are made on a limit gage, interchangeable basis.

The De Laval Double-helical Speed-reducing Gear is not an ingenious idea based upon imperfectly developed theories, but an accomplished fact.

It is based upon the principle that a correctly cut gear, correctly mounted and protected from external distorting forces, will run smoothly and noiselessly and will not be subject to excessive wear or deterioration.

If interested in saving weight and fuel, and in the greater simplicity and lower first cost of geared turbines for ship propulsion, write us, giving particulars of the proposed boat so that we may supply full information.

We are prepared to furnish marine steam turbines and gears in any capacity and for any steam conditions.

DE LAVAL
Steam Turbine Co.
TRENTON, N. J.

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We desire to announce to the trade that we have been appointed sole agents of The Signal and Control Company for the sale of its device known as "Electric Automatic Whistle Operator".

This is an apparatus of undisputed merit and it has been on the market for many years.

Estimates for complete outfits, including whistle, furnished upon request.

Pneumercator Company, Inc.

118 Liberty Street
NEW YORK

...OR...

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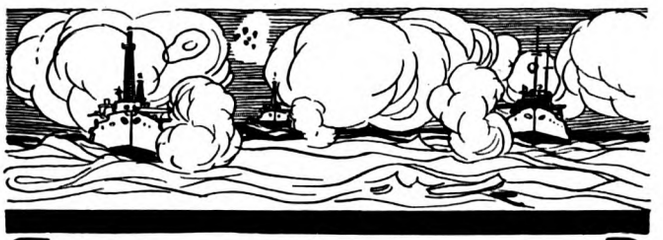


Holding the Records in the Navies of the World

The records for Economy, Capacity and Endurance in the Navies of the World, are held by

BABCOCK & WILCOX FORGED STEEL

Marine Water-Tube Boilers

and

Superheaters

Moreover, the same superior characteristics have been proved in the Merchant Marine.

Do you know that Babcock & Wilcox Boilers and Superheaters in one vessel are saving more than 15 per cent over Scotch boilers in sister vessels?

Isn't such a great reduction in coal bills of very great interest to you?

All essential parts of Babcock & Wilcox Boilers are heavier than the corresponding parts in Scotch boilers, thus giving greater security against corrosion.

Let us send you full details explaining why "Babcock & Wilcox" stands for **safety, ease of cleaning** and **simplicity of operation.**

A large portion of our business consists of "repeat-orders." You know what that means. ***Write us at once.***

The Babcock & Wilcox Co.

NEW YORK and LONDON

When You Buy
DIXON'S
The Pioneer BOILER GRAPHITE

You not only get a remedy for boiler scale but you get the benefit of

THE DIXON NAME which for eighty-nine years has been the international leader in the production of Graphite.

THE DIXON EXPERIENCE which covers the entire history of the application of graphite for every conceivable purpose.

THE DIXON REPUTATION which has been built by selling the right graphite for the right purpose.

DIXON'S (The Pioneer) BOILER GRAPHITE saves a lot of money in the cost of cleaning boilers.

Booklet No. 77 T tells HOW and WHY the FLAKE GRAPHITE is superior.

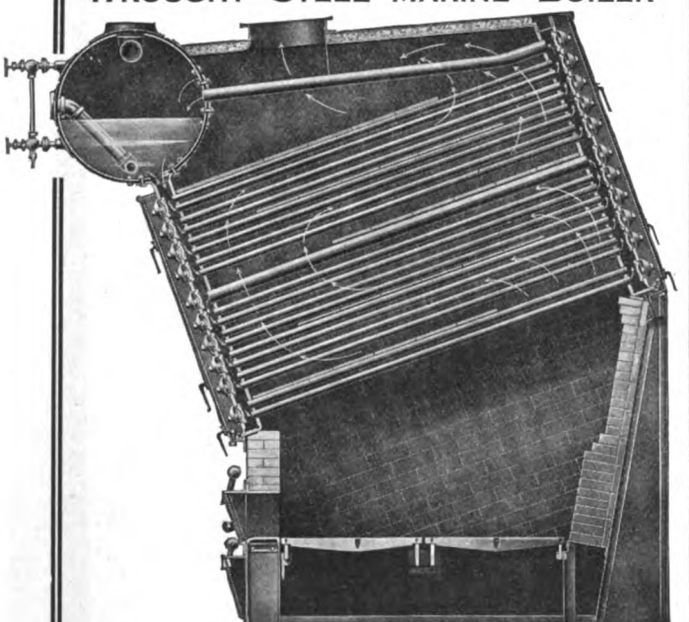
Send for it.

Made in JERSEY CITY, N. J., by the

Joseph Dixon Crucible Co.

Established 1827 T2-1

WARD'S
WROUGHT STEEL MARINE BOILER



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GENERATING TUBES EXPANDED. NO OTHER JOINTS. NO NIPPLE CONNECTIONS. NO STAYBOLTS.

The Charles Ward Engineering Works

CHARLESTON, WEST VIRGINIA

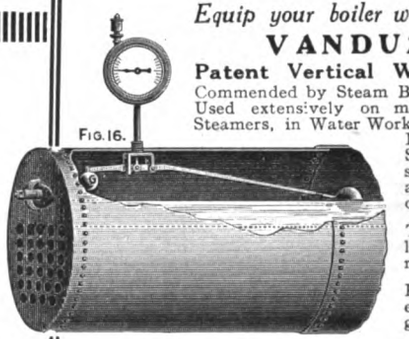
MARINE ENGINES RIVER STEAMERS

Equip your boiler with a reliable

VANDUZEN

Patent Vertical Water Gauge

Commended by Steam Boiler Inspectors. Used extensively on most large River Steamers, in Water Works and Stationary Engine Boilers. Simple in construction, durable and reliable in operation.



The dials are large and easily read.

Reliability and effectiveness guaranteed.

THE E. W. VANDUZEN CO.

428-434 E. Second St. Cincinnati, O.

The Barton Steam Trap

For General Use on Steamboats

Listing of ship does not affect its operation. It cannot freeze or become air bound. Keeps pipe lines free from condensation, thereby insuring your cargo. Makes the heaters heat. Does away with cylinder cocks on deck engines. Does its work regardless of temperature. More than 1,000 in successful operation on lake boats. Barton traps are dividend makers. A Barton trap installed on trial will answer the question of economy.

Barton traps used on 150 boats on the lakes. (Used on steering, deck engines, forward auxiliary lines, forward main exhaust lines, after radiator lines, hot water tanks, in fact any place where a steam trap can be used the Barton trap is successfully operated.) When in Cleveland call Harvard 1532 and learn more about it.

JOHN W. BARTON

Owner of

Barton Steam Trap Co., 2707 Vestry Ave., Cleveland, O.

Formerly of Automatic Steam Trap Specialty Co., Detroit.

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FIRE TUBE MARINE SUPERHEATER

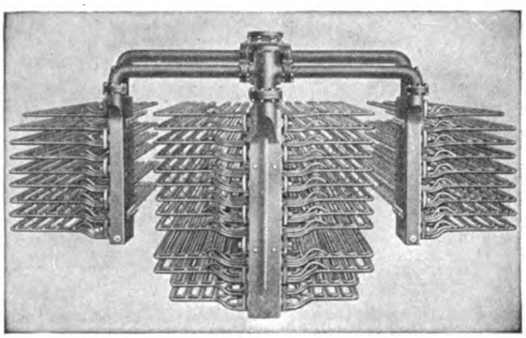
EIGHT REASONS WHY

1. It is adaptable to either new or existing boilers of the fire tube type and can be applied with no change in design or construction.

2. It renders possible an increase in output of boiler horse power from a given boiler plant, 10% to 20%.

3. It will produce the same power output with fewer boilers.

4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.

6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges and condensation in the cylinders.

7. It does not prevent rapid, thorough and frequent cleaning of the tubes.

8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, NEW YORK, N. Y. **Peoples Gas Bldg., CHICAGO, ILL.**

"Watch the Thermometer"

Eckliff Boiler Circulators

¶ If your Scotch Boilers are Eckliff-equipped, they're hot at the bottom and steaming at highest efficiency.

¶ If they are not Eckliff-equipped, they're not hot at the bottom and are not steaming at highest efficiency.

¶ Why not put your boilers in the Highest Efficiency class?

¶ Eckliff results are proved results—and they're guaranteed.

GET THE BOOKLET

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ECKLIFF AUTOMATIC BOILER CIRCULATOR CO.

DETROIT **54 Shelby Street** **MICHIGAN**

The McNab

"Known throughout the Maritime World."

The McNab Direction Indicators

(Gold Medal and Diploma Awards) indicate every movement and record the engine revolutions on the bridge. Thousands installed and specified for installation on 90% of steam vessels building in this country.

NO STEAMER COMPLETE WITHOUT IT.

The Willett-Bruce S. S. Whistle Control

The only control adopted by **all** Trans-Atlantic and other Lines; large number of installations on order and installed in this country.

An automatic fog signal assured, and a **dry, clear, crisp, penetrating** blast guaranteed.

The McNab Pneumatic Engine Counter

Connect it up by a pipe and install it on your steam gauge board; do away with your constant clattering rods and small gear; it is a "revolution in counters."

The McNab "Cascade" Boiler Circulator and Fuel Economizer

Hundreds installed; a practical Circulator that **does circulate** and **economize.**

Write for a full set of our books.

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or

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Real bargains in Passenger and Freight Boats, Dredges, Tugs, Dredging Machinery, Engines, Boilers, Cranes, and other opportunities are awaiting you.

Take a Look Now—You May Find Something Interesting

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(Marine Type)

Made to last for years—No repairs necessary.
Used on purifiers, ash gun and water columns as well as in blow-off service.
Will replace any leaky valve in two years with a new one or refund money.
Self-cleaning and self-grinding.
Simple construction—Easily operated.
Will pass Government inspection 250 lb. pressure.

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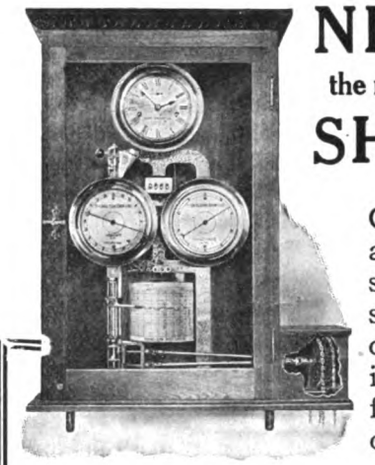
SCULLY STEEL & IRON COMPANY
2364 S. Ashland Ave.
CHICAGO, ILL.



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the most advanced type of
SHIP LOG

Gives the mileage sailed, and shows the exact speed per hour on a dial, recording it on a chart for every minute of the trip.

The Nicholson Recording Ship Log is installed on battle ships, passenger ships, bulk freighters, car ferries, yachts, and motor boats.

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Cleveland, O.

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SHIPS TELEGRAPHS

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Electric Whistle Operators

Electric Lighting Equipments, Fixtures, Etc.

Electric and Mechanical Bells

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Installations

Chas. Cory & Son, Inc.
290 HUDSON STREET, NEW YORK CITY

Reilly Heaters

Designed especially for marine service. Light in weight; small in size. Interior easily accessible; no piping connections to be disturbed. Copper coils act as springs, and all interchangeable

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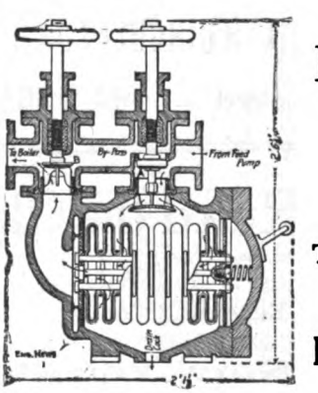
2121 West St. Building **New York**



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Feed-Water Filters

will keep oil out of your boiler

They Have No Equal

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Ross Valve Mfg. Co.
Troy, N. Y.

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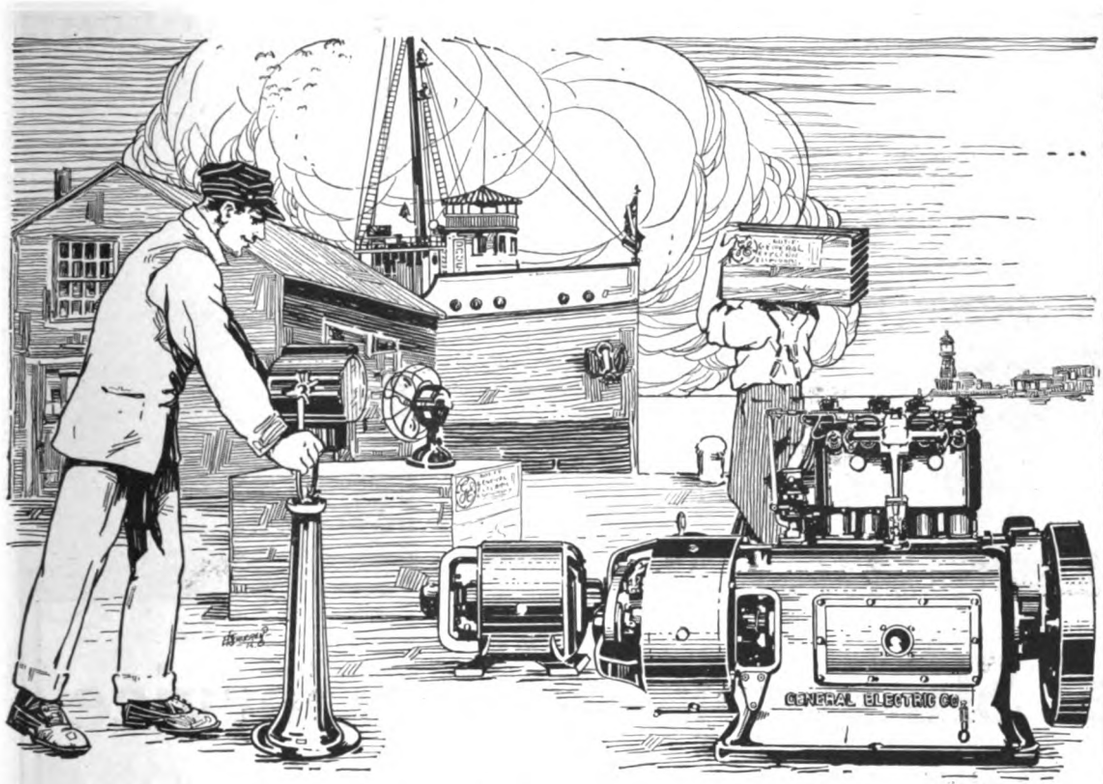

Electrify every ship on your line

You will be surprised how much real protection and benefit electricity is on shipboard. Passengers and crew appreciate the good, bright light and the electric fans and electric heaters are a distinct advertisement for your boats.

G-E electric equipment on board ship will give the same continuous satisfactory service as the G-E generator in the big power plants ashore—they are built with the same knowledge, experience and reputation behind them.

Let our engineers assist you in selecting the right kind of electric power equipment particularly suited to your different boats.

The following are made especially for marine use:

Switchboard
Meters and Instruments
Wire and Cable
Wiring Devices
MAZDA Lamps
Telltale Boards
Electric Bake Ovens and Ranges
Electric Radiators Tubular and Luminous
Searchlights—Incandescent and Arc
Internal Combustion Engine Generating Sets
Steam Engine Generators
Turbo Generators
Motors

This trade-mark the guarantee of excellence on Goods Electrical

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Buffalo, N. Y.
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Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Dayton, Ohio
Denver, Colo.
Des Moines, Iowa
Duluth, Minn.
Elmira, N. Y.
Erie, Pa.
Fort Wayne, Ind.
Hartford, Conn.
Indianapolis, Ind.
Jacksonville, Fla.
Joplin, Mo.
Kansas City, Mo.
Knoxville, Tenn.
Los Angeles, Cal.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
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New York, N. Y.
Niagara Falls, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburg, Pa.
Portland, Ore.
Providence, R. I.
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Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

For MICHIGAN business refer to General Electric Company of Michigan, Detroit, Mich.

For TEXAS, OKLAHOMA and ARIZONA business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City.

For CANADIAN business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

General Electric Company

General Office: Schenectady, N. Y.

6302

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Steel Ships for Ocean Service

The good ships JOHAN MJELDE and GIJONES lifted anchor recently and sailed from the yards of the American Ship Building Company at Cleveland for far-away Norway. Also the GISLA and GAUTE and VESTLAND have sailed from our yards at Detroit and NORDAL from South Chicago. These six ships for Norwegian service are built to Lloyd's rules for ocean service and will carry approximately 3200 gross tons deadweight.

Bow of Norwegian steamer built on the Great Lakes showing part of cargo handling equipment.

Five large plants with the most modern equipment insure rapid construction

Our five complete shipbuilding plants located at Cleveland, Lorain, Detroit, South Chicago and Superior, Wis., are fully equipped to build vessels of any class for lake, ocean, sound or river service, and in addition our plants at Buffalo and Milwaukee have every facility for promptly handling repair work.

We also furnish and install all kinds of marine and stationary engines, boilers, windlasses and auxiliary machinery.

The American Ship Building Company

CLEVELAND, OHIO

M. E. FARR, President **O. J. FISH, Vice-President** **A. G. Smith, General Manager**

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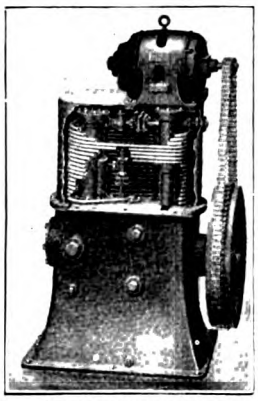

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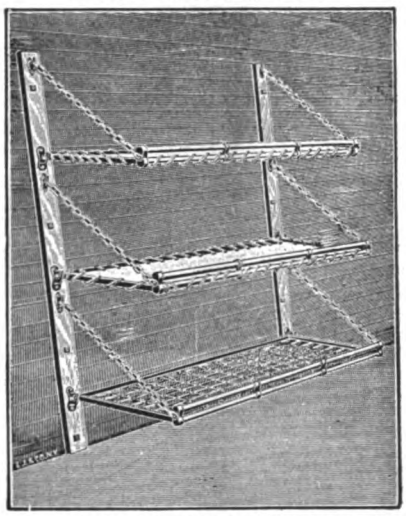
The ***PEERLESS*** is the most compact mechanical refrigerating machine made. ***Absolutely automatic in every detail.*** Oil Trap—Condenser Coils—Compressor and Liquid. Receiver within one casing. All parts interchangeable—easy of access. Has highest efficiency—requires minimum space. Refrigerates—cools water—makes ice for passenger ships—freighters—yachts, private craft and all types of vessels where refrigeration is a requirement.

Let us estimate on your refrigerating plants.

PEERLESS ICE MACHINE COMPANY 72 WEST ADAMS STREET CHICAGO

The Southern - Rome Company

BALTIMORE, MD.



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MANUFACTURERS OF

Metal Berths and Bunks of Every Description

Illustrated Catalog upon request

SOUTHERN-ROME COMPANY

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The battleships Oklahoma, New York, California, Delaware, Texas, Arizona, Pennsylvania and Idaho as well as a number of destroyers are equipped with

DYSON PROPELLERS

These propellers, as the name implies, are designed by Captain Chas. W. Dyson, U. S. Navy, and are made under his personal supervision.

They carry the features of efficiency guaranteed by the reputation of Capt. Dyson, who is a recognized authority on the subject of screw propulsion.

Eliminate the waste of propulsive power by installing DYSON PROPELLERS.

Catalog upon application

AMERICAN MANGANESE BRONZE CO.
HOLMESBURG, PA.

The Lake Erie Drydock and Mill Co.

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LAUNCHES SCOWS
DREDGES TUGS

Our Marine Ways and Saw Mill enable us to give exceptional service in rebuilding and heavy repairing of all kinds

PROVABLE FACTS—

IF you want to experiment—you won't be interested in the WAGER PATENT IMPROVED FURNACE BRIDGE WALL. BUT if you want a bridge wall that has in it five years of making good; a bridge wall that is turning the marine industry away from the antiquated fire brick; one that insures less smoke, minimum upkeep, greater efficiency and backed up by responsible references including all the leading railroad, freight and passenger steamer companies, private yacht owners, stationary plants and others—you WILL be interested in the WAGER BRIDGE.

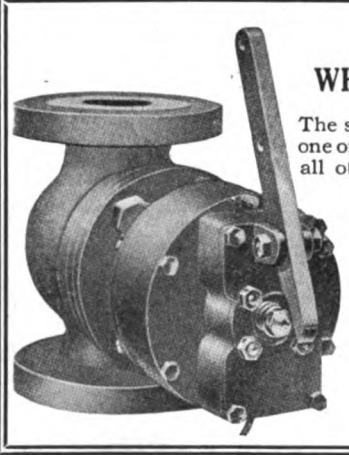
This isn't argument, or persuasion, or contention. It's just simple, provable facts. May we prove these facts to you?

ROBERT H. WAGER

FURNACE BRIDGE WALLS

New York **Philadelphia** **Detroit**

New York Office: Singer Building - - - - Telephone: Cortlandt 4299



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The simplicity of installation is one of the many advantages over all other electrically controlled Whistle Valves; saves time, material, weight, maintenance and cost.

Eliminating instruments and wiring in wheelhouse.

Eliminating the use of Electric Motors for operating.

Electric Control Co.
161 Washington St.
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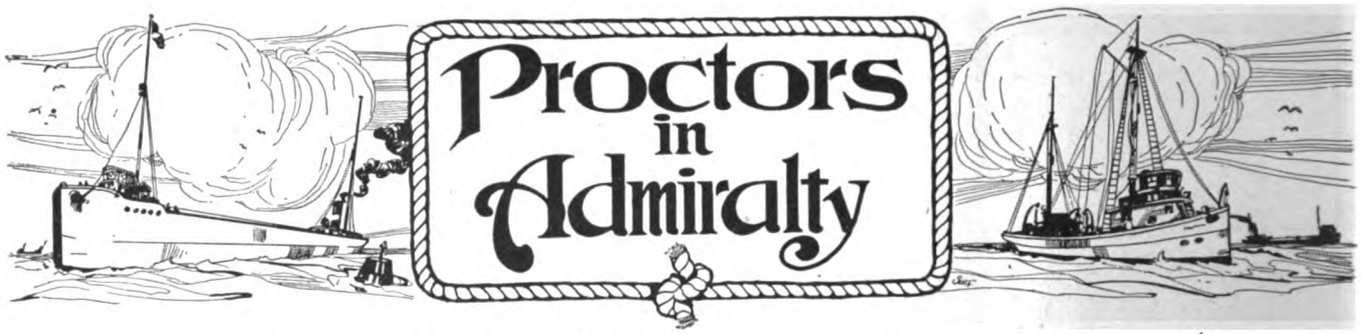

This directory is maintained for the benefit of vessel owners and operators who occasionally require the counsel and service of experienced Admiralty Proctors.

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PROCTOR IN ADMIRALTY
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PROCTOR IN ADMIRALTY
Suite 1012-1016 Insurance Exchange Building
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GOULDER, WHITE AND GARRY
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LILLIE, LILLIE & LILLIE
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William B. Cady
Sanford W Ladd
Joseph G. Hamblen, Jr.
Sherwin A. Hill
Claudius B. Grant, Counsel
Union Trust Building, Detroit

Albert B. Davidson Roberts P. Hudson
DAVIDSON & HUDSON
ATTORNEYS AT LAW
Proctors in Admiralty
Sault Ste. Marie - - - - Michigan

Each of the ads on this page is a seed planted in a large circle of vessel owners. It grows by repetition until it bears the fruit of business.
323

Do you handle Admiralty cases?
Yes?
Why not do a little shouting—you can handle more? You have a vast field of prospects, BUT, what are you doing to introduce yourself to them?
322

This page of Admiralty Proctors' cards is a directory for the vessel owner or operator. You can have your card in this directory at a surprisingly low cost.
321

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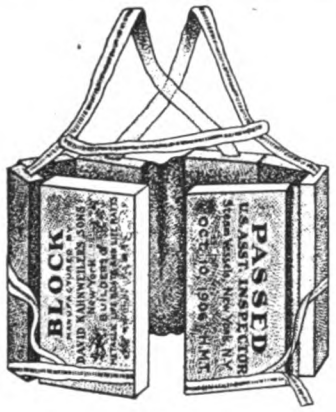


Solid Block Cork Life Preservers

Warranted 24 pounds. Buoyancy and full weight of Cork and Workmanship as required by U. S. Inspectors.

SAFEST CHEAPEST

SOLID CORK LIFE PRESERVERS
RING BUOYS AND FENDERS

Approved and adopted by U. S. Board of Supervising Inspectors. Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Awarded four Medals by World's Columbian Exposition.

METALLIC AND WOODEN LIFE BOATS
METALLIC LIFE RAFT
MARINE DRAGS LYLE GUNS

WICKS' PATENT RELEASING BLOCKS FOR LIFE BOATS

DAVID KAHNWEILER'S SONS

260 FRONT ST., COR. DOVER ST. NEW YORK CITY

Lifeboats, Rafts, Davits

Famous for their QUALITY and ECONOMY

CATALOG ON REQUEST

WELIN MARINE EQUIPMENT CO.

305 Vernon Avenue LONG ISLAND CITY, N. Y.

LANE LIFE BOATS

C. M. LANE LIFE BOAT CO.

250 HURON ST. BROOKLYN, N.Y.

LAST LONGEST

ANDREW J. MORSE & SON, Inc.

221 High Street BOSTON, MASS.

ESTABLISHED 1837

Diving Apparatus and Submarine Armor
Fire Department Supplies
The Morse Monitor Nozzle

LIFE PRESERVERS

Cork Cushions, Fenders, Cork Ring Buoys

"Ye Oldest Cork House in America"

ESTABLISHED 1865

JUSTUS BRAUER & SON

129 Arch Street Incorporated Philadelphia, Pa.

McArthur Jacob's Ladder

This ladder embraces several new features which have been dictated by experience and is the ideal ladder for use aboard ship.

It is now made in sections of any desired length. The sections can be instantly connected by means of snap hooks, adapting the ladder to light or loaded conditions of ships and eliminating the telescopic feature of the former type.

The cable is of plow steel combining lightness with great strength; the steps stamped sheet metal with two-tooth prongs giving a firm foothold; hooks bronze and rivets copper.

The ladder can be compactly rolled up for storage.

"We beg to advise that the Jacob's Ladder furnished the steamer Castalia during season 1913 has proven very satisfactory indeed. The master, Capt. W. L. Girardin, reports that these ladders should be installed on all the boats as they are very efficient and much safer than the old style roper ladder."

The Brown Steamship Company, Cleveland.

McArthur Portable Fire Escape Co.

CLEVELAND OHIO

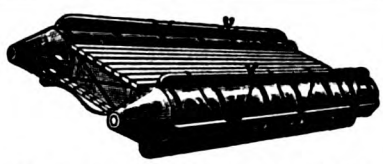
The McArthur Jacob's Ladder is patented and all infringements upon it will be prosecuted

THOS. DREIN & SON COMPANY

Established 1866
WILMINGTON, DEL.

Sole Builders of the

Patent Beaded Bottom Metallic Life Boats, Life Rafts and Wooden Boats of all classes.



Outfits for Lake Steamers a Specialty

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John J. Boland — Adam E. Cornelius

BOLAND & CORNELIUS

VESSEL OWNERS AND BROKERS

Marine Insurance Agents

1204 Prudential Building,
BUFFALO, N. Y.

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W. C. RICHARDSON & CO.

VESSEL OWNERS AND BROKERS AND
MARINE INSURANCE AGENTS

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Office Tel., Main 338
Residence 'Phone { W. C. Richardson, Doan 404
John T. Kelly, East 3610
Clarence E. Richardson, Eddy 492

Co-Operative Grain Trimmers

Fort William, Ontario

Let us Trim your Steamers
We know how

W. L. Cook, Manager — Phone—South 184

D. SULLIVAN — A. C. SULLIVAN

D. SULLIVAN & COMPANY

VESSEL AGENTS

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208 South LaSalle Street
CHICAGO, ILL.

C. L. Hutchinson — W. H. McGean

HUTCHINSON & CO.

VESSEL AND INSURANCE AGENTS

Phones: { Office: Main 2453
Res. C. L. Hutchinson, Marlo 244
Res. W. H. McGean, Garfield 274

1011 Leader-News Bldg. — Cleveland

VANCE & JOYS CO.

VESSEL AND INSURANCE AGENTS

1004-1006 First National Bank Building

TELEPHONE MAIN 3907

MILWAUKEE, WIS.

Vessel and Insurance Agents—Everywhere

Need ***The Marine Review*** back of them today more than ever before because the prestige of the paper is constantly increasing.

The very men in the marine field—the actual boat owners and operators—whose business you wish to obtain can be effectively reached thru this paper and at a trifling cost.

The price of two good cigars a day applied to ***Marine Review*** publicity will enable you to substantially increase your business, and the possibilities should prompt you to make early reservation.

Tell us you're interested and we'll submit rates.

THE MARINE REVIEW

Cleveland, Ohio

230

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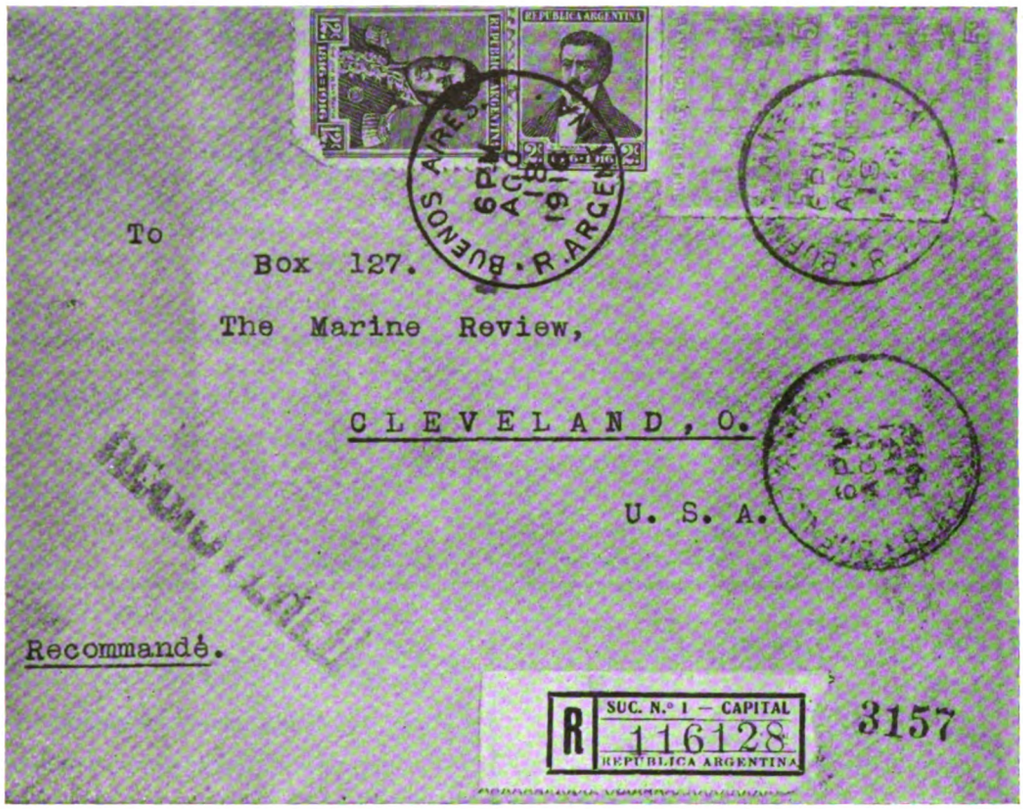
They come from all corners of the Earth



Reply to Classified Ad.

This letter, one of the many that have come from foreign lands, shows unmistakably that you'll find MARINE REVIEW readers on every civilized shore. It is substantial proof that the MARINE REVIEW circulation is not confined to any one region but that it encircles the globe.

An analysis of the editorial and advertising sections of the paper reveals the reason why MARINE REVIEW readers are men of affairs and influence and why MARINE REVIEW advertising is so profitable.

If you haven't read our analysis of the MARINE REVIEW and its readers, write for it today. You should read it.

THE MARINE REVIEW

Cleveland, Ohio

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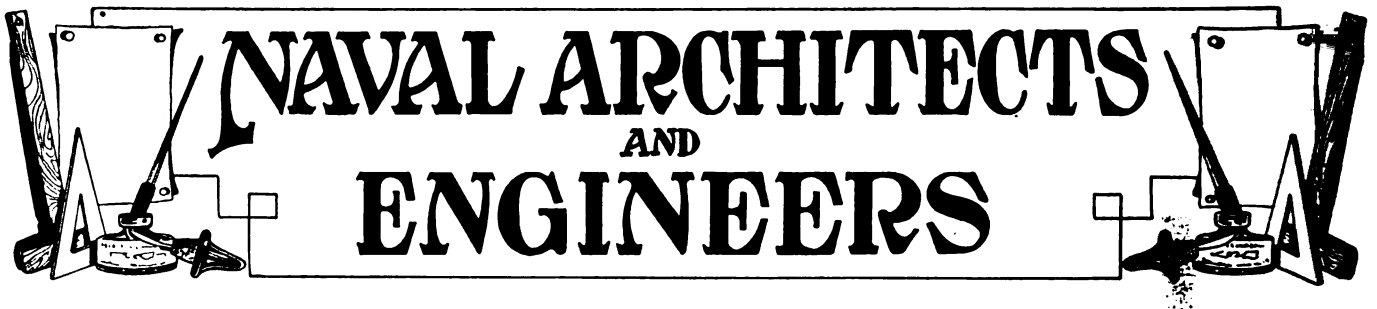

W. I. BABCOCK H. PENTON
BABCOCK & PENTON
ENGINEERS AND NAVAL ARCHITECTS
CLEVELAND — Penton Bldg., 1136 Chestnut Av.
NEW YORK — 17 State St.

EDWARD P. FARLEY CO.
Vessel Brokers
Naval Architects and Engineers
Passenger and Freight Steamers, Tugs, Lighters, Self-Propelled Canal Barges
1501 Railway Exchange Bldg. Chicago, Illinois

Cablegram: Curr, Port Arthur Telephone: 1553 North
ROBERT CURR
SURVEYOR TO LLOYD'S REGISTER OF SHIPPING
Plans and Specifications furnished for all types of vessels. Careful attention given to superintending construction and repairs.
Instructions on Theoretical and Practical Shipbuilding by Correspondence.
The Observatory 28 S. Water St., Port Arthur, Ont.

M. C. FURSTENAU
CONSULTING MARINE ENGINEER
NAVAL ARCHITECT
All classes of vessels and machinery designed
Tests and surveys made
308 Walnut St.
Tel. Lombard 2789A PHILADELPHIA, PA.

WILLIAM T. DONNELLY
Designer of Floating Dry Docks, Steel and Wood.
PLANS ON HAND FOR DOCKS FROM 2,000 TO 20,000 TONS
Electricity applied to Marine Transportation
Harbor Improvements
Consulting Engineer and Naval Architect
17 Battery Place NEW YORK

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NAVAL ARCHITECTS
17 BATTERY PLACE ::: NEW YORK
Offices: London Glasgow Montreal

Robert H. Kidd, Manager Telephone No. 1
Joseph Kidd & Son
MARINE ARCHITECTS
AND SURVEYORS
Ship and Engine Damage and Other Surveys Carefully Attended To
406 Palladio Building DULUTH, MINN.

PENTON'S BOOK NEWS
SPECIALIZES IN
BOOKS FOR THE MARINER
and is Prepared to Furnish any Publication in Print
PENTON'S BOOK NEWS
Penton Building CLEVELAND, OHIO

Every Professional Man Knows

The value of the right kind of publicity but few actually apply that knowledge to their business.

The man who constantly keeps his name before the readers of a trade paper that reaches every branch of the industry in which he is interested is the one who prospers.

Mr. Marine Architect—Mr. Marine Engineer! If you are not advertising in ***The Marine Review***, and you want to attain greater success, an ad. on this page will bring the desired results.

You need this service—let's start something for you in the next issue.

Write today for rates.

THE MARINE REVIEW :: :: :: **Cleveland, Ohio**

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There are many kinds of **sheet packing.** Some kinds give service for but a **short** time. These, regardless of cost, are **expensive.**

Other kinds give **long** service—**profitable** service. These, if bought at a reasonable price, are **economical.**

N.B.O. Sheet Packing

is the **Economical** kind of sheet packing. It is the **"cheapest per year"** sold, because it gives you the most service for your money.

"N. B. O." is unequaled as a joint packing, not only on steam lines, but also on **ammonia, gas, oil** and **alkali.**

We'll be glad to send you a sample piece large enough for you to give it a satisfactory trial.

Write today for our illustrated catalog

HOME RUBBER CO.
TRENTON, N. J.

MARINE PAINTS

B. P. S.

Trade Mark Registered

BEST PAINT SOLD

We manufacture high grade paints.

For Every Part of Every Ship

"B. P. S." means refinement—means durability—means economy.

Write our nearest branch for details and prices.

The Patterson Sargent Co.
Cleveland Chicago New York

BPS

STRATFORD OAKUM

QUALITY GUARANTEED

JERSEY CITY and EVERYWHERE

GEO. STRATFORD OAKUM CO., 165 Cornelison Ave., Jersey City, U. S. A.

The Clothel Company

MANUFACTURERS OF

Low Pressure

REFRIGERATING MACHINES

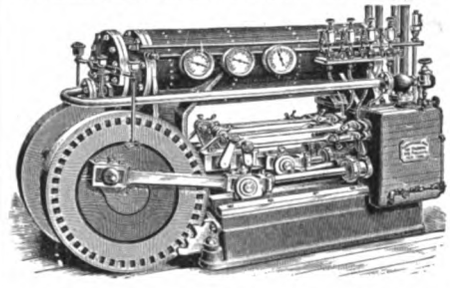
Marine Work a Specialty

Office:

61 Broadway - NEW YORK, N. Y.

The Allen Dense-Air Ice Machine

contains no chemicals. It is placed in the engine room, while the ice-making box and meat rooms are at distant places of the steamer.



Over two hundred in daily service in the tropics on men-of-war, steam yachts and mercantile steamers.

H. B. ROELKER, Designer and Manufacturer of Screw Propellers
41 Malden Lane NEW YORK

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"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶ Index to advertisements will give you page number of any advertiser and by referring to advertisement you can get full particulars about products.

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Hutchinson & Co., Cleveland, O.
Richardson, W. C., & Co., Cleveland, O.
Sullivan, D. & Co., Chicago, Ill.
Vance & Joys Co., Milwaukee, Wis.

AIR RECEIVERS.
(Welded Steel.)
Continental Iron Works, The, Brooklyn, N. Y.

AIR TOOLS.
Independent Pneumatic Tool Co., Chicago, Ill.

ANCHORS.
American Engineering Co., Philadelphia, Pa.

ARCHITECTS.
(Naval.)
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Donnelly, Wm. T., New York, N. Y.
Farley, Edward P., Co., Chicago, Ill.
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Hoyt, Dustin, Kelley, McKeehan & Andrews, Cleveland, O.
Kremer, C. E., Chicago, Ill.
Lillie, Lillie & Lillie, Grand Haven, Mich.
Spencer & Spencer, Duluth, Mich.
Warren, Cady & Ladd, & Hill, Detroit, Mich.

AVERAGE COUNTERS.
Cummings Ship Instrument Wks., Boston.

BARS.
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Falls Hollow Staybolt Co., Cuyahoga Falls, O.

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Safety Car Heat'g & Light'g Co., New York.

BEDSTEADS.
(Brass and Steel.)
Southern-Rome Co., Baltimore, Md.

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Van Duzen, The E. W., Co., Cincinnati, O.

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(Ship.)
Southern-Rome Co., Baltimore, Md.

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Blackmer Rotary Pump Co., Petoskey, Mich.

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Ritchie, E. S., & Sons, Brookline, Mass.

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(Flue.)
American Ship Building Co., Cleveland, O.

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Kahnweiler's, David, Sons, New York City.
Rocky River Dry Dock Co., Rocky River, O.

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Dixon, Joseph Crucible Co., Jersey City, N. J.

BOILER NOZZLES.
(Welded Steel.)
Continental Iron Works, The, Brooklyn, N. Y.

BOILER STEAM AND WATER DRUMS.
(Welded.)
Continental Iron Wks., The, Brooklyn, N. Y.

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Collingwood Ship Bldg. Co., Ltd., Collingwood, Ont.
Lake Erie Boiler Works, Buffalo, N. Y.

BOILERS.
(Marine.)
Almy Water Tube Boiler Co., Providence, R. I.
American Ship Building Co., Cleveland, O.
Babcock & Wilcox Co., New York, N. Y.
Bath Iron Works, Bath, Me.
Chicago Ship Bldg. Co., So. Chicago, Ill.
Commercial Boiler Works, The, Seattle, Wash.
Delaney, P., & Co., Newburgh, N. Y.
Detroit Ship Building Co., Detroit, Mich.
Fletcher, W. A., & Co., Hoboken, N. J.
Johnson Bros., Ferrysburg, Mich.
Kingsford Fdy. & Mch. Wks., Oswego, N. Y.
Lake Erie Boiler Works, Buffalo, N. Y.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Moore & Scott Iron Works, San Francisco.
Seattle Construction & Dry Dock Co., Seattle.
Superior Ship Bldg. Co., Superior, Wis.
Toledo Ship Building Co., Toledo, O.
Ward, Chas., Engrg. Co., Charleston, W. Va.

BOILERS.
(Water Tube.)
Ward, The Chas., Engrg. Works., Charleston, W. Va.

BOILER REPAIRS.
Commercial Boiler Works, The, Seattle, Wash.

BOAT REPAIRS.
Rocky River Dry Dock Co., Rocky River, O.

BOOKS.
Penton's Book News, Cleveland, O.

BRASS GOODS.
Penberthy Injector Co., Detroit, Mich.
Williams, Wm. E., New York, N. Y.

BRASS SPECIALTIES.
Detroit Ship Building Co., Detroit, Mich.
Williams, Wm. E., New York, N. Y.

BROKERS.
(Vessel.)
Boland & Cornelius, Buffalo, N. Y.
Richardson, W. E., & Co., Cleveland, O.
Sullivan, D., & Co., Chicago, Ill.

BRONZE.
(Manganese.)
American Manganese Bronze Co., Holmesburg, Pa.

BRONZE SCREW PROPELLERS.
American Manganese Bronze Co., Holmesburg, Pa.

BRUSHES, GRAPHITE.
(For Motor or Dynamo.)
Dixon, Joseph, Crucible Co., Jersey City, N. J.

BRUSHES.
(Vulcan Rubber Cemented.)
John L. Whiting—J. J. Adams Co., Boston.

BUOYS.
Kahnweiler's, David, Sons, New York City.
Williams, Wm. E., New York, N. Y.

BUOYS.
(Gas and Spar.)
Safety Car Heat'g & Light'g Co., New York.

BUSHINGS.
(Adjustable.)
Armstrong Mfg. Co., Bridgeport, Conn.

CABLES.
Durable Wire Rope Co., Boston, Mass.
Waterbury Co., New York, N. Y.
Williams, Wm. E., New York, N. Y.

CAPSTANS.
American Engineering Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.
Dake Engine Co., Grand Haven, Mich.

CARPENTERS.
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.

CASTINGS.
Collingwood Ship Bldg. Co., Collingwood, Ont.

CASTINGS.
(Brass and Bronze.)
Dake Engine Co., Grand Haven, Mich.
Trout, H. G., Co., Buffalo, N. Y.

CAULKING COTTON.
Stratford Oakum Co., Geo., Jersey City, N. J.

CHOCKS.
American Engineering Co., Philadelphia, Pa.
Welin Marine Equipment Co., Long Island City, N. Y.

CIRCULATORS.
(Boiler.)
Eckliff Automatic Boiler Circulator Co., Detroit, Mich.
McNab Co., Bridgeport, Conn.

COAL.
(Producers and Shippers.)
Hall, Geo., Coal Co., Ogdensburg, N. Y.
Hanna, M. A., & Co., Cleveland, O.
Lorain Coal & Dock Co., Columbus, O.
Pickands, Mather & Co., Cleveland, O.

COMPASSES.
Ritchie, E. S., & Sons, Brookline, Mass.

CONDENSERS.
American Engineering Co., Philadelphia, Pa.
Williams, Wm. E., New York, N. Y.

CONDENSER SHELLS.
(Welded Steel.)
Continental Iron Works, The, Brooklyn, N. Y.

CONVEYORS.
General Electric Co., Schenectady, N. Y.

CORDAGE.
Waterbury Co., New York, N. Y.
Williams, Wm. E., New York, N. Y.

CORK.
Brauer, Justus, & Sons, Inc., Philadelphia, Pa.

CORK JACKETS AND CORK RINGS.
Kahnweiler's, David, Sons, New York, N. Y.
Williams, Wm. E., New York, N. Y.

COUCHES AND COTS.
(Folding.)
Southern-Rome Co., Baltimore, Md.

COUCH HAMMOCKS.
Southern-Rome Co., Baltimore, Md.

COUNTERS.
(Averaging.)
Cummings Ship Instrument Works, Boston.

CRANES.
General Electric Co., Schenectady, N. Y.

CRANES.
(Dock.)
American Engineering Co., Philadelphia, Pa.

CRANES.
(Electric Boat.)
American Engineering Co., Philadelphia, Pa.

CRANES.
(Locomotive.)
American Engineering Co., Philadelphia, Pa.

CRAYONS.
(Lumber.)
Dixon, Joseph, Crucible Co., Jersey City, N. J.

CUTTERS.
(Pipe.)
Armstrong Mfg. Co., Bridgeport, Conn.

CYLINDERS.
(Welded.)
Continental Iron Works, The, Brooklyn, N. Y.

DAMAGE ADJUSTERS.
Kidd, Joseph, & Son, Duluth, Minn.

DAVITS.
Welin Marine Equipment Co., Long Island City, N. Y.

DAVITS AND DAVIT FALLS.
Welin Marine Equipment Co., Long Island City, N. Y.

DERRICKS.
Dake Engine Co., Grand Haven, Mich.
Superior Iron Works, Superior, Wis.

DESIGNERS.
(Ship.)
Babcock & Penton, Cleveland, O.
Curr, Robert, Port Arthur, Ont., Can.
Furstenau, M. C., Philadelphia, Pa.

DIES.
Armstrong Mfg. Co., Bridgeport, Conn.

DIVING APPARATUS.
Morse, A. J., & Son, Boston, Mass.
Schrader's, A., Sons, Inc., Brooklyn, N. Y.

DOCK DESIGNERS.
Donnelly, Wm. T., New York, N. Y.

See Index to Advertisements for pages containing advertisements of companies listed above

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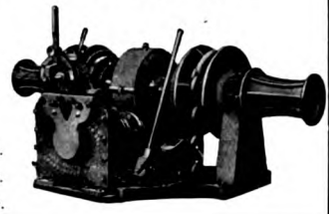
CAPSTANS
WINDLASSES
MOORING HOISTS
DRILL HOISTS
SPUD HOISTS, ETC.

Write for new catalog; just out.



DAKE ENGINE CO.
Grand Haven, Mich.
New York Agent: Charles H. Hughes, Lord's Court Bldg., 27 William St.
Chicago Agent: J. E. Chisholm, 1410 Fisher Bldg.
Detroit Agent: Derrick Supply Co., 1070 Penobscot Bldg.

Ashton Highest Grade
POP SAFETY VALVES AND STEAM GAGES
Guaranteed to give Unequalled Efficiency, Durability and Perfect Satisfaction.

Special Features in Valves
Outside Pop Regulation, Cam Lever Attachment, Jessop Steel Spring, Gages have Non-Corrosive Movements, Accurately Graduated Dials, Seamless Drawn Springs.

Specify the Ashton and Get the Best

THE ASHTON VALVE COMPANY
271 Franklin St. - BOSTON, MASS.
Branches: New York Chicago Philadelphia San Francisco

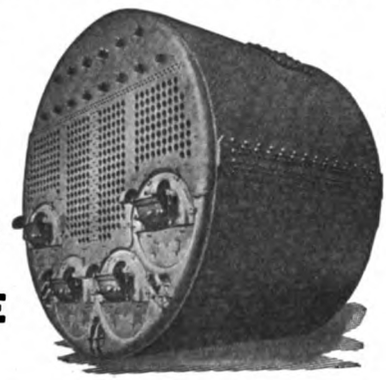
Commercial Boiler Works

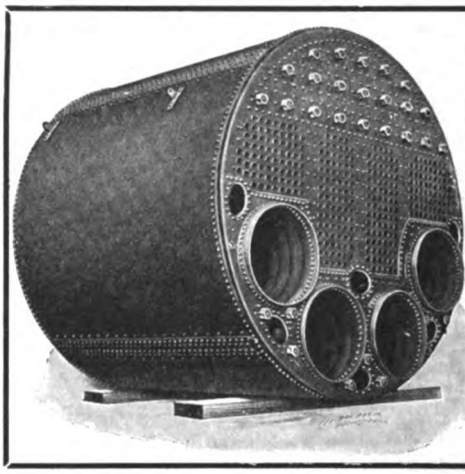
Manufacturers and Repairers of Boilers

Marine Work a Specialty

All Kinds of Sheet Iron Work

SEATTLE U. S. A.

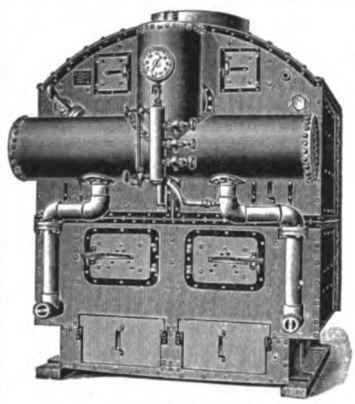




MARINE BOILERS

OF ALL TYPES

KINGSFORD FOUNDRY & MACHINE WORKS,
Oswego, N. Y.



Almy Water Tube Boiler Co.
Builders of Sectional Water Tube Boilers for all types of vessels
Providence, R. I. U. S. A.

CATALOGUE FREE

Put This Down
If FUEL COAL is needed on the St. Lawrence River

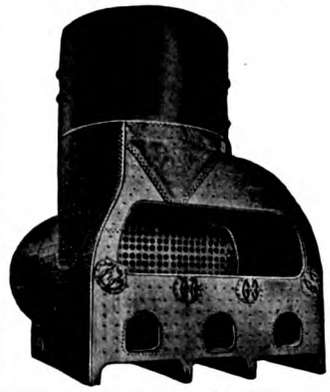
HALL'S COAL
ALL'S SERVICE
ALL'S PRICE
BEATS 'EM ALL
MONTREAL, P. Q. OGDENSBURG, N. Y.

BOOKS

We can fill your order for any book in print on any subject.
Tell us your needs and we will be glad to recommend the best books for your purpose.

Penton's Book News
Penton Building CLEVELAND, OHIO
512

MARINE BOILERS



MARINE REPAIRS

Newburgh Steam Boiler Works

P. DELANY & CO.
NEWBURGH, N. Y.

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DRAFT.
(Artificial and Mechanical for Boilers.)
American Ship Building Co., Cleveland, O.
Detroit Ship Building Co., Detroit, Mich.

DRAFT GAGE.
Blackmer Rotary Pump Co., Petoskey, Mich.
McNab Co., Bridgeport, Conn.

DRAFT REGISTERING INSTRUMENTS.
Pneumercator, The, Co., New York City, N. Y.

DREDGING MACHINERY.
American Engrg. Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.
Superior Ship Building Co., Superior, Wis.

DREDGING OUTFIT CONSTRUCTORS.
Buffalo Dry Dock Co., Buffalo, N. Y.

DRILLS.
(Pneumatic.)
Independent Pneumatic Tool Co., Chicago, Ill.

DROPS.
(Wharf.)
American Engineering Co., Philadelphia, Pa.

DRY DOCKS.
American Ship Building Co., Cleveland, O.
Baltimore Dry Dock & Ship Bldg. Co., Baltimore, Md.
Chicago Ship Building Co., Chicago, Ill.
Collingwood Ship Bldg. Co., Ltd., Collingwood, Ont., Can.
Detroit Ship Building Co., Detroit, Mich.
Lake Erie Dry Dock & Mill Co., Sandusky, O.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Rocky River Dry Dock Co., Rocky River, O.
Seattle Construction & Dry Dock Co., Seattle, Wash.
Superior Ship Building Co., Superior, Wis.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.
Toledo Ship Building Co., Toledo, O.

DYNAMOS.
General Electric Co., Schenectady, N. Y.

EJECTORS.
Penberthy Injector Co., Detroit, Mich.

ELECTRICALLY CONTROLLED DEVICE.
Electric Control Co., New York City, N. Y.

ENAMELS.
Patterson-Sargent Co., Cleveland, O.

ENGINEERS.
(Marine, Mechanical and Consulting.)
Babcock & Penton, Cleveland, O.
Donnelly, Wm. T., New York, N. Y.
Farley, Edward P., Co., Chicago, Ill.
Furstenau, M. C., Philadelphia, Pa.
Griscom-Russel, The, Co., New York City.
Moore & Scott Iron Works, San Francisco.
Seattle Construction & Dry Dock Co., Seattle.

ENGINEERS' SPECIALTIES.
Penberthy Injector Co., Detroit, Mich.
Ross Valve Co., Troy, N. Y.
Williams, Wm. E., New York, N. Y.

ENGINES.
American Engineering Co., Philadelphia, Pa.
American Ship Building Co., Cleveland.
Chase Machine Co., Cleveland, O.
Seattle Construction & Dry Dock Co., Seattle.
Superior Iron Works, Superior, Wis.

ENGINES.
(Hoisting.)
American Engineering Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.
Superior Iron Works, Superior, Wis.

ENGINES.
(Marine.)
American Ship Building Co., Cleveland, O.
Bath Iron Works, Bath, Me.
Chase Machine Co., Cleveland, O.
Chicago Ship Bldg. Co., So. Chicago, Ill.
Collingwood Ship Building Co., Ltd., Collingwood, Ont., Can.
Detroit Ship Building Co., Detroit, Mich.
Fletcher, W. A., Co., Hoboken, N. J.
Fore River Ship Bldg. Corp., Quincy, Mass.
Johnston Bros., Ferrysburg, Mich.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Superior Ship Building Co., Superior, Wis.
Toledo Ship Building Co., Toledo, O.
Trout, H. G., Co., Buffalo, N. Y.
Ward, Chas., Engrg. Co., Charleston, W. Va.

ENGINES.
(Mooring.)
American Engineering Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.

ENGINES.
(Steering.)
American Engineering Co., Philadelphia, Pa.

ENGINE STOPPING DEVICES.
Mulholland Hatch-Fastener Co., Cleveland, O.

EUROPEAN PASSENGERS & FREIGHT.
American Line, New York, N. Y.
International Mercantile Marine Co., New York, N. Y.

FASTENERS.
(Hatch.)
Mulholland Hatch-Fastener Co., Cleveland, O.

FILTERS.
(Feed Water.)
Griscom-Russell, The, Co., New York City.
Ross Valve Mfg. Co., Troy, N. Y.
Williams, Wm. E., New York, N. Y.

FIRE ESCAPES.
McArthur Portable Fire Escape Co., Cleveland

FIRE ALARM SYSTEMS.
Cory, Chas., & Sons, New York, N. Y.

FIRE DEPARTMENT SUPPLIES.
Morse, A. J., & Son, Boston, Mass.
Williams, Wm. E., New York, N. Y.

FIXTURES.
General Electric Co., Schenectady, N. Y.

FLANGES.
(Forged Steel Boiler.)
Scully Steel & Iron Co., Chicago, Ill.

FLOOR PLATES.
(Wrought Steel Diamond & Ribbed Pattern.)
Scully Steel & Iron Co., Chicago, Ill.

FLUE CLEANERS.
(Soot and Scale.)
Scully Steel & Iron Co., Chicago, Ill.

FORGINGS.
Collingwood Ship Bldg. Co., Ltd., Collingwood, Ont., Can.

FORGINGS.
(Steel.)
Fore River Ship Bldg. Corp., Quincy, Mass.

FOUNDERS.
Chase Machine Co., Cleveland, O.
Kingsford Fdy. & Mach. Co., Oswego, N. Y.
Seattle Const. & Dry Dock Co., Seattle, Wash.

FRICTION BOARD.
Stratford Oakum Co., Geo., Jersey City, N. J.

FUELING COMPANIES AND COAL DEALERS.
Hall, Geo., Coal Co., Ogdensburg, N. Y.
Hanna, M. A., & Co., Cleveland, O.
Lorain Coal & Dock Co., Columbus, O.
Pickands, Mather & Co., Cleveland, O.

FURNACES.
(Boilers.)
Continental Iron Works, The, Borough of Brooklyn, N. Y.

FURNACE FRONTS AND DOORS.
(Land and Marine.)
Continental Iron Works, The, Borough of Brooklyn, N. Y.

GAGES.
(Steam.)
Ashton Valve Co., Boston, Mass.
Williams, Wm. E., New York, N. Y.

GAGES.
(Water.)
Penberthy Injector Co., Detroit, Mich.
Williams, Wm. E., New York, N. Y.

GEARS.
(Marine Reduction.)
Hunt, Mirk & Co., San Francisco, Cal.
Hunt, Mirk & Co., Seattle, Wash.
Westinghouse Mch. Co., Pittsburgh, Pa.

GENERATORS.
General Electric Co., Schenectady, N. Y.
International Oxygen Co., New York, N. Y.

GRAIN TRIMMERS.
Co-Operative Grain Trimmers, Fort William, Ont., Can.

GRAPHITE.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

GRAPHITE.
(Boiler Lubricating, Greases.)
Dixon, Joseph, Crucible Co., Jersey City, N. J.

GRATE BARS.
Trout, H. G., Co., Buffalo, N. Y.
Williams, Wm. E., New York, N. Y.

GREASES.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

GRINDERS.
(Pneumatic.)
Independent Pneumatic Tool Co., Chicago, Ill.

GYPSEYS.
(Steam.)
American Engrg. Co., Philadelphia, Pa.

HAMMERS.
(Pneumatic.)
Independent Pneumatic Tool Co., Chicago, Ill.

HAMMERS.
(Steam.)
Chase Machine Co., Cleveland, O.

HATCH FASTENERS.
Mulholland Hatch-Fastener Co., Cleveland, O.

HEATERS AND PURIFIERS.
(Feed Water.)
Ross Valve Mfg. Co., Troy, N. Y.
Williams, Wm. E., New York, N. Y.

HOISTS.
(Air.)
American Ship Building Co., Cleveland, O.

HOISTS.
(Anchor.)
Superior Iron Works, Superior, Wis.

HOISTS.
(Cargo, Etc.)
American Engineering Co., Philadelphia, Pa.
Boston & Lockport Block Co., East Boston, Mass.
Chase Machine Co., Cleveland, O.
Dake Engine Co., Grand Haven, Mich.
General Electric Co., Schenectady, N. Y.

HOISTS.
(Chain.)
Dake Engine Co., Grand Haven, Mich.
Williams, Wm. E., New York, N. Y.

HOISTS.
(Electric.)
American Engineering Co., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.

HOISTS.
(Pneumatic.)
Dake Engine Co., Grand Haven, Mich.

HOSE.
Schrader's, A., Son, Inc., Brooklyn, N. Y.
Williams, Wm. E., New York, N. Y.

HOSE.
(Pneumatic.)
Independent Pneumatic Tool Co., Chicago, Ill.

HOSE COUPLINGS.
Independent Pneumatic Tool Co., Chicago, Ill.

HOTELS.
Hotel Tuller, Detroit, Mich.

HYDROGEN GENERATORS.
International Oxygen Co., New York, N. Y.

ICE MACHINES.
Clothel Co., The, New York City, N. Y.
Peerless Ice Machine Co., Chicago, Ill.
Roelker, H. B., New York City, N. Y.

INDICATORS.
Cummings Ship Instrument Wks., Boston.
Electro-Dynamic Co., Bayonne, N. J.
McNab Co., Bridgeport, Conn.

INDICATORS.
(Direction.)
Cummings Ship Instrument Works, Boston.
Electro-Dynamic Co., Bayonne, N. J.
McNab Co., Bridgeport, Conn.

INDICATORS.
(Recording.)
McNab Co., Bridgeport, Conn.

INDICATORS.
(Speed.)
Cummings Ship Instrument Works, Boston.
McNab Co., Bridgeport, Conn.

INJECTORS.
Penberthy Injector Co., Detroit, Mich.
Williams, Wm. E., New York, N. Y.

INSURANCE.
(Marine.)
Boland & Cornelius, Buffalo, N. Y.
Hutchinson & Co., Cleveland, O.
Richardson, W. C., & Co., Cleveland, O.
Vance & Joys, Milwaukee, Wis.

IRON ORE.
Hanna, M. A., & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.

IRON SHIP REPAIRS.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.

JOINER WORK.
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.

LADDERS.
(Portable.)
McArthur Portable Fire Escape Co., Cleveland

LAMPS.
(Mazda and Arc.)
General Electric Co., Schenectady, N. Y.
Williams, Wm. E., New York, N. Y.

LANTERNS.
(Buoy.)
Safety Car Heating & Lighting Co., New York

LAUNCHES.
Drein, Thomas, & Son, Wilmington, Del.

LIFE BOATS.
Detroit Ship Bldg. Co., Detroit, Mich.
Drein, Thomas, & Son, Wilmington, Del.
Kahnweiler's, David, Sons, New York, N. Y.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.
Welin Marine Equipment Co., Long Island City, N. Y.
Williams, Wm. E., New York, N. Y.

LIFE RAFTS.
Detroit Ship Building Co., Detroit, Mich.
Drein, Thos., & Son, Wilmington, Del.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.

LIFE BOAT RELEASING DEVICE.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.
Mulholland Hatch Fastener Co., Cleveland, O.

LIFE BOAT SYSTEM.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.
Welin Marine Equipment Co., Long Island City, N. Y.

LIFE PRESERVERS.
Brauer, Justus, & Son, Inc., Philadelphia, Pa.
Kahnweiler's, David, Sons, New York City.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.

LIFE PRESERVERS.
(Ilanasilk.)
Robinson-Roders Co., The, Newark, N. J.

LIFE SAVING EQUIPMENT.
Brauer, Justus, & Son, Inc., Philadelphia, Pa.
Drein, Thos., & Son, Wilmington, Del.
Kahnweiler's, David, Sons, New York City.
Lane, C. M., Life Boat Co., Brooklyn, N. Y.
Welin Marine Equipment Co., Long Island City, N. Y.

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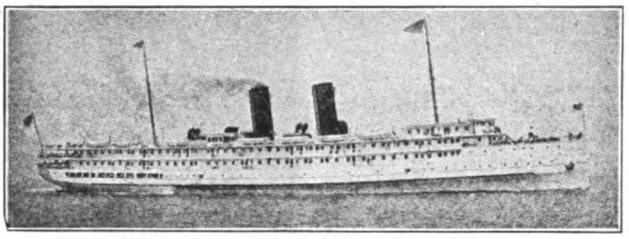

TURBINE STEAMSHIPS YALE AND HARVARD

Marine Engines, Boilers
and Machinery of All Kinds

Contractors for
Vessels Complete

W. & A. FLETCHER COMPANY, Hoboken, N. J.

H. G. Trout Company
King Iron Works
BUFFALO, N. Y.

Manufacturers of High Grade
PROPELLER WHEELS

Marine Engines
Brass and Iron Castings

Large variety of Grate Bars in stock

Write for particulars and testimonials.

The Blue Book of American Shipping

THIS BOOK is the standard marine directory of the United States. It contains lists of steam vessels on Atlantic and Pacific coasts, with names and addresses of owners; lists of ship yards, engine and boiler builders, naval architects, admiralty lawyers, ship chandlers and all interests related to marine affairs. Its statistics of lake commerce are complete.

Price, postpaid to any address, $5.00

PENTON'S BOOK NEWS, - Cleveland, Ohio

John Wanamaker Says:

Advertising doesn't jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year, until it exerts an irresistible power.

324

PROPELLER DESIGNS

METHOD **DYSON** SUPERVISION

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WRITE FOR LIST OF USERS AND
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Consulting Engineers
Captain C. W. Dyson
Luther D. Lovekin, M. E.

Director
Raymond E. Lovekin

U. S. Metallic Packing

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Marine Engine

Piston Rods and Valve Stems

The U. S. Metallic Packing Co.,
PHILADELPHIA, PA.

Write for Catalog

Meet me at the TULLER

For Value, Service, Home Comfort

New **HOTEL TULLER**

Detroit, Michigan

Center of business on Grand Circus Park. Take Woodward car, get off at Adams Avenue

ABSOLUTELY FIREPROOF

200	Rooms,	Private	Bath,	$1.50	Single,	$2.50	Up Double
200	"	"	"	2.00	"	3.00	" "
100	"	"	"	2.50	"	4.00	" "
100	"	"	"	3.00 to 5.00	"	4.50	" "

Total 600 Outside Rooms

ALL ABSOLUTELY QUIET

Two Floors—Agents' Sample Rooms

New Unique Cafes and Cabaret Excellente

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Safety Car Heating & Lighting Co., New York City.

LIGHTS.
(Electric.)
Cory, Chas., & Son, New York City, N. Y.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVE SUPERHEATERS.
Locomotive Superheater Co., New York, N. Y.

LOGS.
(Patent.)
Cummings Ship Instrument Works, Boston.

LOGS.
(Ship.)
Nicholson Ship Log Co., Cleveland, O.
Walker, Thomas & Son, Birmingham, Eng.

LUBRICANTS.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

LUBRICATING GRAPHITE.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

LUBRICATORS.
Penberthy Injector Co., Detroit, Mich.

MACHINERY.
Kingsford Fdy. & Machine Co., Oswego, N. Y.

MACHINERY.
(Marine.)
American Ship Building Co., Cleveland, O.
Chase Machine Co., Cleveland, O.
Chicago Ship Building Co., South Chicago, Ill.
Collingwood Ship Building Co., Ltd., Collingwood, Ont., Can.
Dake Engine Co., Grand Haven, Mich.
Detroit Ship Building Co., Detroit, Mich.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Ship Building Corp., Quincy, Mass.
Johnston Bros., Ferrysburg, Mich.
Manitowoc Ship Building Co., Manitowoc, Wis.
Superior Iron Works, Superior, Wis.
Superior Ship Building Co., Superior, Wis.
Toledo Ship Building Co., Toledo, O.

MACHINERY.
(Refrigerating.)
Peerless Ice Machine Co., Chicago, Ill.

MACHINISTS.
Chase Machine Co., Cleveland, O.
Seattle Construction & Dry Dock Co., Seattle, Wash.
Superior Iron Works, Superior, Wis.

MANGANESE BRONZE.
American Manganese Bronze Co., Holmesburg, Pa.

MARINE BOILERS AND MACHINERY.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.

MARINE RAILWAYS.
Lake Erie Dry Dock & Mill Co., Sandusky, O.
Rocky River Dry Dock Co., Rocky River, O.

MARINE REDUCTION GEARS.
Hunt, Mirk & Co., San Francisco, Cal.
Hunt, Mirk & Co., Seattle, Wash.
Westinghouse Machine Co., Pittsburgh, Pa.

MARINE REPAIRS.
American Ship Building Co., Cleveland, O.
Buffalo Dry Dock Co., Buffalo, N. Y.
Chicago Ship Building Co., So. Chicago, Ill.
Collingwood Ship Bldg. Co., Ltd., Collingwood, Ont., Can.
Milwaukee Dry Dock Co., Milwaukee, Wis.
St. Lawrence Marine Ry. Co., Ogdensburg, N. Y.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.
Toledo Ship Bldg. Co., Toledo, O.

MARINE STATIONARY FURNACE BRIDGE WALLS.
Wager, Robert H., New York, N. Y.

MARINE SUPERHEATERS.
Locomotive Superheater Co., New York, N. Y.

MARLINE.
Waterbury Co., New York, N. Y.

MARLINE COVERED WIRE ROPE.
Waterbury Co., New York, N. Y.

MATTRESSES AND PILLOWS.
(Ilanasilk.)
Robinson-Roders Co., The, Newark, N. J.

MECHANICAL WORKS.
Engberg's Elec. & Mech. Works, St. Joseph, Mich.

METALLIC PACKING.
U. S. Metallic Packing, The, Co., Philadelphia

METERS.
(Torsion.)
Cummings Ship Instrument Works, Boston.

MOORING LINES.
Durable Wire Rope Co., Boston, Mass.

MOTORS.
(Electric.)
Electro-Dynamic Co., Bayonne, N. J.
General Electric Co., Schenectady, N. Y.

MOTORS.
(Winch.)
General Electric Co., Schenectady, N. Y.

MUSIC WIRE.
Waterbury Co., New York, N. Y.

NAUTICAL INSTRUMENTS.
Ritchie, E. S., & Sons, Brookline, Mass.

NAVIGATION COMPANIES.
Cleveland & Buffalo Transit Co., Cleveland, O.

NOZZLES.
Morse, A. J., & Sons, Boston, Mass.

OAKUM.
Stratford, Geo., Oakum Co., Jersey City, N. J.

OILS AND LUBRICANTS.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

OIL.
(Linseed.)
Patterson-Sargent Co., Cleveland, O.

OIL BURNERS.
(Mechanical Atomizing.)
Moore & Scott Iron Wks., San Francisco, Cal.

OXYGEN AND HYDROGEN CYLINDERS AND CYLINDER STUD VALVES.
International Oxygen Co., New York City.

OXYGEN TESTING APPARATUS, WELDING AND CUTTING APPARATUS.
International Oxygen Co., New York City.

OXYGEN GENERATORS.
International Oxygen Co., New York City.

PACKING.
Home Rubber Co., Trenton, N. J.

PACKING.
(Metallic.)
U. S. Metallic Packing, The, Co., Philadelphia

PAINT.
(Copper and Iron.)
Patterson-Sargent Co., Cleveland, O.

PAINT.
(Graphite.)
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Patterson-Sargent Co., Cleveland, O.

PAINT.
(Hull.)
Patterson-Sargent Co., Cleveland, O.

PAINT.
(Marine.)
Patterson-Sargent Co., Cleveland, O.

PATENT IMPROVED FURNACE BRIDGE WALLS.
Wager, Robert H., New York, N. Y.

PATENTS.
Siggers & Siggers, Washington, D. C.

PIG IRON.
Hanna, M. A., & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.

PIPE.
(Welded Steel.)
Continental Iron Works, The, Borough of Brooklyn, N. Y.

PIPE BENDING MACHINES.
Cox, J. Fillmore, Engrg. & Tube Bending Machine Works, Bayonne, N. J.

PIPE WELDING.
Goldschmidt Thermit Co., New York, N. Y.

PLUMBAGO.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

PNEUMATIC TOOLS.
Independent Pneumatic Tool Co., Chicago, Ill.

PNEUMERCATORS.
Pneumercator, The, Co., New York City.

POWER PLANTS.
General Electric Co., Schenectady, N. Y.

PROJECTORS.
(Electric.)
General Electric Co., Schenectady, N. Y.

PROPELLERS.
(Screw.)
American Screw Propeller Co., Philadelphia.

PROPELLER BLADES.
Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS.
American Ship Building Co., Cleveland, O.
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.
Case, A. Wells, & Son, Highland Park, Conn.
Detroit Ship Building Co., Detroit, Mich.
Fore River Ship Building Corp., Quincy, Mass.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Roelker, H. B., New York City, N. Y.
Sheriffs Mfg. Co., Milwaukee, Wis.
Superior Ship Bldg. Co., Superior, Wis.
Toledo Ship Building Co., Toledo, O.
Trout, H. G., Co., Buffalo, N. Y.

PUMPS.
Boston & Lockport Block Co., E. Boston, Mass.

PUMPS AND APPLIANCES.
(Air.)
Kingsford Fdy. & Mch. Co., Oswego, N. Y.

PUMPS.
(Bilge.)
Blackmer Rotary Pump Co., Petoskey, Mich.

PUMPS.
(Miscellaneous Use.)
Blackmer Rotary Pump Co., Petoskey, Mich.
Kingsford Fdy. & Mch. Co., Oswego, N. Y.
Roelker, H. B., New York City, N. Y.
Van Duzen, The E. W., Co., Cincinnati, O.

PYROMETERS.
Locomotive Superheater Co., New York, N. Y.

REFRIGERATING MACHINERY.
Clother, The, Co., New York City, N. Y.
Peerless Ice Machine Co., Chicago, Ill.
Roelker, H. B., New York City, N. Y.

REGISTERING INSTRUMENTS.
(Draft.)
Pneumercator, The, Co., New York City.

REGULATORS.
(Pressure.)
Ross Valve Mfg. Co., Troy, N. Y.

RELEASING DEVICE.
(Life Boat.)
Mulholland Hatch-Fastener Co., Cleveland, O.

REPAIRS.
(Boiler.)
Commercial Boiler Wks., The, Seattle, Wash.

REPAIRS.
(Marine.)
American Ship Building Co., Cleveland, O.
Baltimore Dry Dock & Ship Bldg. Co., Baltimore, Md.
Buffalo Dry Dock Co., Buffalo, N. Y.
Chicago Ship Building Co., So. Chicago, Ill.
Collingwood Ship Bldg. Co., Ltd., Collingwood, Ont., Can.
Delaney, P., & Co., Newburgh, N. Y.
Detroit Ship Building Co., Detroit, Mich.
Fore River Ship Bldg. Corp., Quincy, Mass.
Goldschmidt Thermit Co., New York City.
Johnston Bros., Ferrysburg, Mich.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Rocky River Dry Dock Co., Rocky River, O.
St. Lawrence Marine Ry. Co., Ogdensburg, N. Y.
Seattle Construction & Dry Dock Co., Seattle, Wash.
Superior Ship Bldg. Co., Superior, Wis.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.
Toledo Ship Bldg. Co., Toledo, O.

REVOLUTION COUNTERS.
Cummings Ship Instrument Works, Boston.

RIGGING.
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.

RIVER STEAMERS.
Ward, The Chas., Engrg. Works., Charleston, W. Va.

ROPE.
Durable Wire Rope Co., Boston, Mass.

ROPE.
(Wire, Manilla and Fibreclad.)
Waterbury Co., New York City, N. Y.
Williams, Wm. E., New York, N. Y.

ROPE AND FITTINGS.
Durable Wire Rope Co., Boston, Mass.

ROPE DRESSING.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

ROPE DRIVES.
Waterbury Co., New York City, N. Y.

SEARCHLIGHTS.
General Electric Co., Schenectady, N. Y.

SCREW PROPELLERS.
American Screw Propeller Co., Philadelphia.

SCREW PROPELLERS.
(Manganese Bronze.)
American Manganese Bronze Co., Holmesburg, Pa.

SHEATHING FELT.
Stratford Oakum Co., Geo., Jersey City, N. J.

SHEAVES.
Boston & Lockport Block Co., East Boston, Mass.

SHEAVE LUBRICATING DEVICE.
Mulholland Hatch Fastener Co., Cleveland, O.

SHEET IRON WORKS.
Commercial Boiler Works, The, Seattle, Wash.

SHIP BUILDING SYSTEM.
Isherwood, J. W., London, E. C., England.

SHIP BUILDERS.
American Ship Bldg. Co., Cleveland, O.
Baltimore Dry Docks & Ship Bldg. Co., Baltimore, Md.
Bath Iron Works, Bath, Me.
Buffalo Dry Dock Co., Buffalo, N. Y.
Chicago Ship Building Co., South Chicago, Ill.
Collingwood Ship Building Co., Ltd., Collingwood, Ont., Can.
Detroit Ship Building Co., Detroit, Mich.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Ship Bldg. Corp., Quincy, Mass.
Johnston Bros., Ferrysburg, Mich.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Moore & Scott Iron Works, San Francisco.
Seattle Const. & Dry Dock Co., Seattle, Wash.
Superior Ship Building Co., Superior, Wis.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.
Toledo Ship Building Co., Toledo, O.

SHIP CAULKERS.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.

SMOKE STACKS.
Lake Erie Boiler Works, Buffalo, N. Y.

SPACING TABLE.
Standard Bridge Tool Co., Pittsburgh, Pa.

See Index to Advertisements for pages containing advertisements of companies listed above

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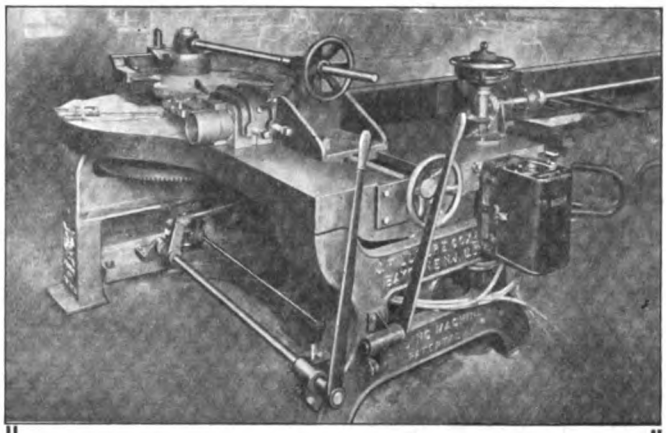

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"New York"

"Philadelphia"

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219 St. Charles St., New Orleans
14 N. Dearborn St., Chicago
Northwest Corner 11th and Locust Sts., St. Louis
121 South Third St., Minneapolis
319 Geary St., San Francisco
619 Second Ave., Seattle
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118 Notre Dame St., Montreal

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SPECIALTIES.
(Steam.)
Penberthy Injector Co., Detroit, Mich.
Ross Valve Mfg. Co., Troy, N. Y.

SPRINGS.
(Bed and Bunk.)
Southern-Rome Co., Baltimore, Md.

STAYBOLTS.
(Boiler, Iron or Steel, Hollow or Solid.)
Falls Hollow Staybolt Co., Cuyahoga Falls, O.
Scully Steel & Iron Co., Chicago, Ill.

STEAM TRAPS.
Barton Steam Trap Co., Cleveland, O.

STEAM TURBINES.
DeLaval Steam Turbine Co., Trenton, N. J.

STEAMSHIP LINES.
(Passenger and Freight.)
American Line, New York City, N. Y.
International Merchantile Marine Co., New York City, N. Y.

STEERING GEARS.
American Engineering Co., Philadelphia, Pa.
American Ship Building Co., Cleveland, O.
Chase Machine Co., Cleveland, O.
Dake Engine Co., Grand Haven, Mich.
Detroit Ship Building Co., Detroit, Mich.

STOCKS.
Armstrong Mfg. Co., Bridgeport, Conn.

STOKERS.
American Engineering Co., Philadelphia, Pa.
Babcock & Wilcox Co., New York, N. Y.

STOPPERS.
(Chain.)
American Engineering Co., Philadelphia, Pa.

SUBMARINE ARMOR.
Morse, A. J., & Son, Boston, Mass.
Schrader's, A., Son, Inc., Brooklyn, N. Y.

SUPERHEATERS.
(Locomotive.)
Locomotive Superheater Co., New York, N. Y.

SUPERHEATERS.
(Marine.)
Babcock & Wilcox Co., New York, N. Y.
Locomotive Superheater Co., New York, N. Y.

SUPPLY HOUSES.
Williams, Wm. E., New York, N. Y.

SURVEYORS.
(Marine.)
Babcock & Penton, Cleveland, O.
Curr, Robert, Port Arthur, Ont., Can.
Furstenau, M. C., Philadelphia, Pa.

SWITCHBOARDS.
General Electric Co., Schenectady, N. Y.

TANKS.
Bath Iron Works, Bath, Me.

TANKS.
(Riveted.)
Lake Erie Boiler Works, Buffalo, N. Y.

TANKS.
(Steel.)
Fore River Ship Bldg. Corp., Quincy, Mass.

TANKS.
(Welded Steel.)
Continental Iron Works, The, Borough of Brooklyn, N. Y.

TELEGRAPH.
(Mechanical.)
Cory, Chas., & Son, New York City, N. Y.

TESTS OF MATERIALS.
Babcock & Penton, Cleveland, O.
Curr, Robert, Port Arthur, Ont., Can.
Furstenau, M. C., Philadelphia, Pa.

THERMIT.
Goldschmidt Thermit Co., New York City.

TORSION METERS.
Cummings Ship Instrument Works, Boston.

TOWING LINES.
(Manila, Wire.)
Waterbury Co., New York, N. Y.

TOWING MACHINES.
American Engrg. Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.

TRAMWAYS.
(Wire Rope.)
Waterbury Co., New York, N. Y.

TRANSMISSION.
(Rope.)
Waterbury Co., New York, N. Y.

TRAPS.
(Steam.)
Barton Steam Trap Co., Cleveland, O.

TUGS.
Bath Iron Works, Bath, Me.

TURBINES.
Bath Iron Works, Bath, Me.
DeLaval Steam Turbine Co., Trenton, N. J.
Fletcher, W. A., & Co., Hoboken, N. J.
Fore River Ship Bldg. Corp., Quincy, Mass.

VALVES.
Ashton Valve Co., Boston, Mass.
Penberthy Injector Co., Detroit, Mich.
Ross Valve Mfg. Co., Troy, N. Y.
Williams, Wm. E., New York, N. Y.

VALVES.
(Blow-Off.)
Scully Steel & Iron Co., Chicago, Ill.

VALVES.
(For Water and Gas.)
Ashton Valve Co., Boston, Mass.
Williams, Wm. E., New York, N. Y.

VESSEL AGENTS.
Vance & Joys Co., Milwaukee, Wis.

VESSEL BROKERS.
Farley, Edward P., Co., Chicago, Ill.
Richardson, W. C., & Co., Cleveland, O.

WELDING.
(Flue.)
Case, A. Wells, & Son, Highland Park, Conn.

WELDING PROCESSES.
Goldschmidt Thermit Co., New York City.

WHISTLE VALVES.
(Electrically Controlled.)
Electric Control Co., New York City.

WINCHES.
American Engineering Co., Philadelphia, Pa.
Chase Machine Co., Cleveland, O.

WINDLASSES.
American Engrg. Co., Philadelphia, Pa.
American Ship Building Co., Cleveland, O.
Dake Engine Co., Grand Haven, Mich.

WIRE.
Waterbury Co., New York, N. Y.

WIRE AND WIRING DEVICES.
General Electric Co., Schenectady, N. Y.

WIRE ROPE.
Durable Wire Rope Co., Boston, Mass.
Waterbury Co., New York, N. Y.

WIRE ROPE DRESSING.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

WOOD BORING MACHINES.
(Pneumatic.)
Independent Pneumatic Tool Co., Chicago, Ill.

WOODEN SHIP REPAIRS.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.

YACHT BUILDERS.
Bath Iron Works, Bath, Me.
Rocky River Dry Dock Co., Rocky River, O.

YACHT PLUMBAGO.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

YARN.
(Lath, Fodder.)
Waterbury Co., New York, N. Y. Manitowoc, Wis.

YAWLS.
Drein, Thos., & Son, Wilmington, Del.
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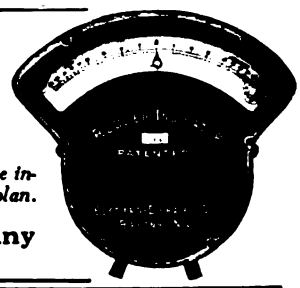

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FOR SALE:—ONE, NUMBER 2 AMERIcan Ship Windlass Towing Machine in first class condition with 1,200 feet, 1½ in. wire cable, now at Cleveland, C. A. Becker, 1011 Rockefeller building, Cleveland, O.

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For Sale:—One Alma Water Tube Boiler, size 8 ft. x 8 ft. x 8 ft. high. Only used 4 months. Price $700, worth $2,500. T. Thurston, Alexandria Bay, N. Y.

SCOW FOR SALE: — LOCATED AT Toledo, 101 ft. long, 27 ft. wide, 5 ft. 6 in. deep. For full information write to the Toledo Builders' Supply Co., Toledo, O.

FOR SALE.
Surface Condensers with Air Circulating Pumps having respectively 4,000, 3,200, 2,600, 2,500, 2,250, 2,000, 900, 500, 350 sq. ft., cooling surface, in good order, available for immediate delivery out of stock.
Marvin Briggs, Inc.,
167 Sixth St. Brooklyn, N. Y.

FOR SALE: — HURD AND HAGGIN, jump spark, heavy duty, six-cylinder, four hundred revolutions per minute, 30 H. P. engine, also dynamo for charging battery, excellent condition, has been used little on account of being too large for my requirements. Will sell cheap. Price upon application, P. O. Box No. 64, Erie, Pa.

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FOR SALE:—SCHOONER SOPHIE, 136 long, 27 ft. 6 in. beam, 10 ft. deep, 261 tonnage, carries 325,000 lumber. O. G. Donaldson, 50 South Division St., Buffalo, N. Y.

TUG ENGINE.
20 x 20 HIGH PRESSURE TUG ENgine. Almost new. For sale at a reasonable price. The Central Dredging Co., Swetland building, Cleveland, O.

FOR SALE: — LARGE F. & A. COMpound Engine, 1,200-1,400 H. P. Leathem & Smith T. & W. Co., Sturgeon Bay, Wis.

FOR SALE:—MOTOR LAUNCH, 42 FT. long, 9 ft. wide, 10 ft. afterdeck, 40 H. P. Globe engine, in good running order; suitable for hauling truck, towing purposes or boating parties. Apply to John McAteer, 2916-18 Richmond St., Philadelphia, Pa.

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RITCHIE

Compasses, Binnacles,

and NAUTICAL Instruments

SOLD IN ALL PARTS OF THE WORLD

Magnets for Adjusting Purposes.

E. S. RITCHIE & SONS

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Lake Shipyard Methods of Steel Ship Construction

By ROBERT CURR.

It shows, step by step, how to build a vessel from the mold loft floor, the cheapest method of construction. Every piece of plate and shape is taken up and the method of laying off clearly explained. The book is copiously illustrated with hundreds of line drawings and numerous photographs and affords in itself, a liberal education in the art of ship building as practiced on the Great Lakes. **$2.00 postpaid to any address.**

Penton's Book News, - Cleveland, Ohio

302

When you think of books, think of Penton.
We can supply any book in print.

PENTON'S BOOK NEWS

Penton Bldg. Cleveland, Ohio

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LAKE ERIE BOILER WORKS

BUFFALO, N. Y.

BOILERS, TANKS and PLATE WORK

OF ALL KINDS

THE MULHOLLAND HATCH-FASTENER COMPANY

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Manufacturers of the Mulholland Simplex and Security Hatch Fasteners. For Ocean and Lake Trade.

OVER 225,000 SETS NOW IN USE ON THE GREAT LAKES

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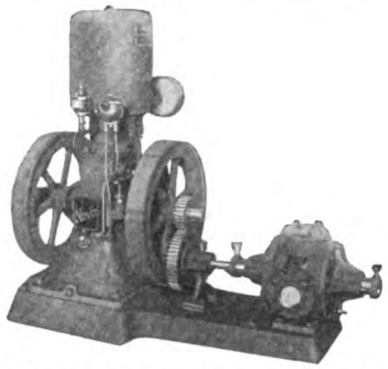
Can You Beat This With Your Bilge Pump?



By using Blackmer you have a pump for fighting fire and washing decks as well as bilge work.

We specialize in Bilge pumps and guarantee them to please you.

They are not an experiment as they have been in actual use for now upwards of nine years.

A letter from any of our customers will prove to you they are superior.

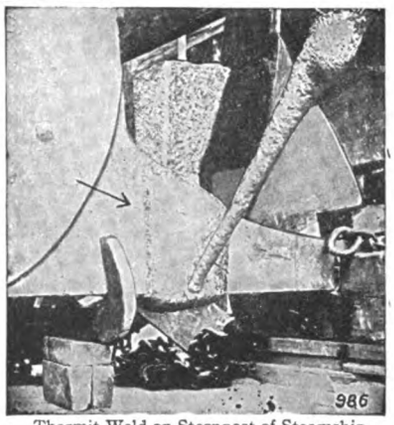
All pumps have but five working parts.

No springs.

Wear automatically taken up.

Priming not necessary.

BLACKMER ROTARY PUMP COMPANY
PETOSKEY, MICH.



Thermit Weld on Sternpost of Steamship "William Henry Mack"

Quick Marine Repairs

Thermit Welding is quick, easy and effective—and when applied to broken rudder frames, sternposts, or sternframes, will enable your **vessel to return to service in two or three days,** effecting a tremendous saving in dry dock charges.

There is nothing experimental about Thermit Welding. During the last few years we have executed many repairs for the principal steamship companies of the Atlantic and Pacific coasts and the Great Lakes and every repair has been uniformly successful and our best advertisement.

Our process is sanctioned by the British Corporation for the Survey and Registry of Shipping, Glasgow.

If you are interested obtain our pamphlet No. 3440 and Reactions, which illustrate and describe many marine repairs and contain full information about the process. Every marine man should have one.

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WILLIAM C. CUNTZ, Gen. Mgr.
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103 Richmond St., W., Toronto, Ont.

ESTABLISHED, 1854.

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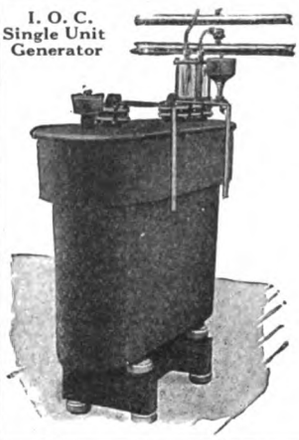
PROPELLER WHEELS and PROPELLER BLADES to fit any hub.

MILWAUKEE, WIS.

I. O. C. Single Unit Generator



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OXYGEN and HYDROGEN
GENERATORS

show such marked economies over purchased gas as to quickly repay the cost of the generator installation—leaving later savings as clear profits.

Send for Catalog No. 3 on "I. O. C. Gas Generators"

INTERNATIONAL OXYGEN CO.
General Sales Offices
115 Broadway, NEW YORK

3

Hollow Threaded Stays

Fully comply with the Federal Inspection Law; save the cost of drilling and breakage of drills. The hole is rolled absolutely in the center. They inspect automatically at both ends, and the air admitted into the firebox through Hollow Stays greatly improves combustion.

QUALITY AND WORKMANSHIP GUARANTEED
Write us for prices

FALLS HOLLOW STAYBOLT COMPANY
CUYAHOGA FALLS, OHIO

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New York City 33 South St. Chicago 413 Fort Dearborn Bldg San Francisco 110 Market St.

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BLOCKS—PUMPS

FERRALL'S HUB HOISTER

The best rope saving coal or cargo hoisting block manufactured. Made for either manila or wire rope. Sheaves are fitted with star metaline bushings and side bearings, which keep the sheaves from heating.

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M.A. HANNA & Co.

Sales Agents, Cleveland

M·A HANNA & Co.

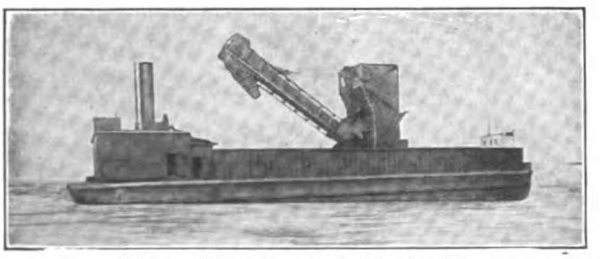
The Lorain Coal & Dock Co.

General Offices: COLUMBUS, OHIO

Producers and Shippers of ECLIPSE HOCKING AND CRESCENT PITTSBURGH COAL

Docks and Fuel Lighter **LORAIN, OHIO**

PICKANDS, MATHER & CO.



Lighter "West Shore," Buffalo, N. Y.
Capacity 500 Tons per hour

FUEL LIGHTERS at Buffalo, Erie, Ashtabula, Cleveland. At Detour, Mich., a Fuel Dock equipped with shute capacity of 600 tons. Best quality Pittsburgh coal furnished at any time during day or night.

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Adopted by the English, German, French, Russian, Italian and United States Lighthouse Departments for Channel and Harbor Lighting. Over 2,200 Buoys and Gas Beacons in service.

Burn Continuously From Eighty to Three Hundred and Sixty-five Days and Can be Seen a Distance of Six Miles

Controlled by

SAFETY CAR HEATING & LIGHTING CO.
2 RECTOR STREET, NEW YORK

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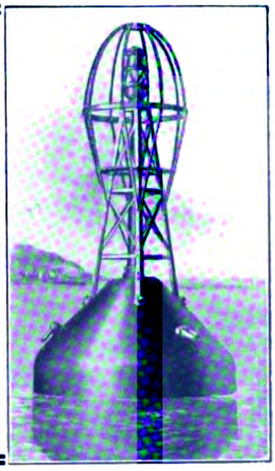

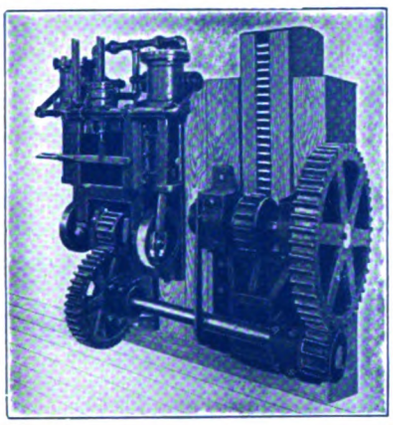

Anchor Hoist Engines and Lock Plates

for Operating Dredge and Drill Boat Anchors

Double 6" x 6", 7" x 9" and 9" x 10" Throttle Reverse Engines

With Gearing to suit the size of Anchors

The Hoist is compact and efficient, and occupies no deck room. Any arrangement can be made to suit local conditions.

We build the engines with either throttle or link reverse, as well as non-reversible and for a great many purposes.

—BUILT BY—

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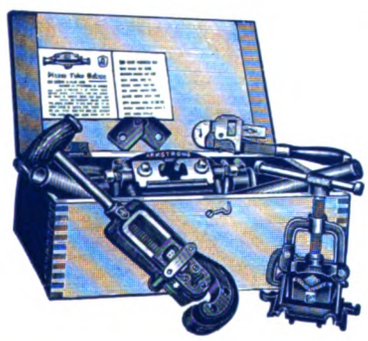


ARMSTRONG COMBINATION KITS

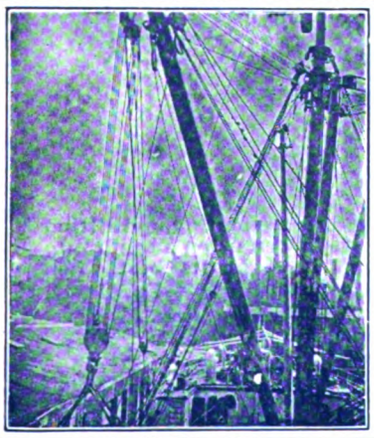
CONSISTING OF

1 No. 2 Genuine Armstrong Stock	¼ in. to	1 in. R
1 " 1 Model B Pipe Cutter	⅛ "	1¼
1 Junior Hinged Pipe Vise	⅛ "	1¼
1 10 in. Stillson Wrench	⅛ "	1

STOCKS ARE FITTED WITH BARD ADJUSTABLE BUSHING IN A HARD WOOD CASE
ENGINEERS AND FITTERS APPRECIATE THIS KIT.

Manufactured by

THE ARMSTRONG MFG. CO.
296 Knowlton St., BRIDGEPORT, CONN.
NEW YORK, 248 Canal St.



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93-95 Pearl St., Boston, Mass.

Durable Wire Rope will **Not Rust** or **Rot** and is not affected by **Salt Water** or **Climatic Conditions**

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Mooring Lines	Towing Hawsers	Stevedoring	Tiller Ropes
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Hoisting	Coal Pockets	Pile Driving	Fasts

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NEW YORK AGENTS: HEGEMAN & WARD, 43 SOUTH STREET

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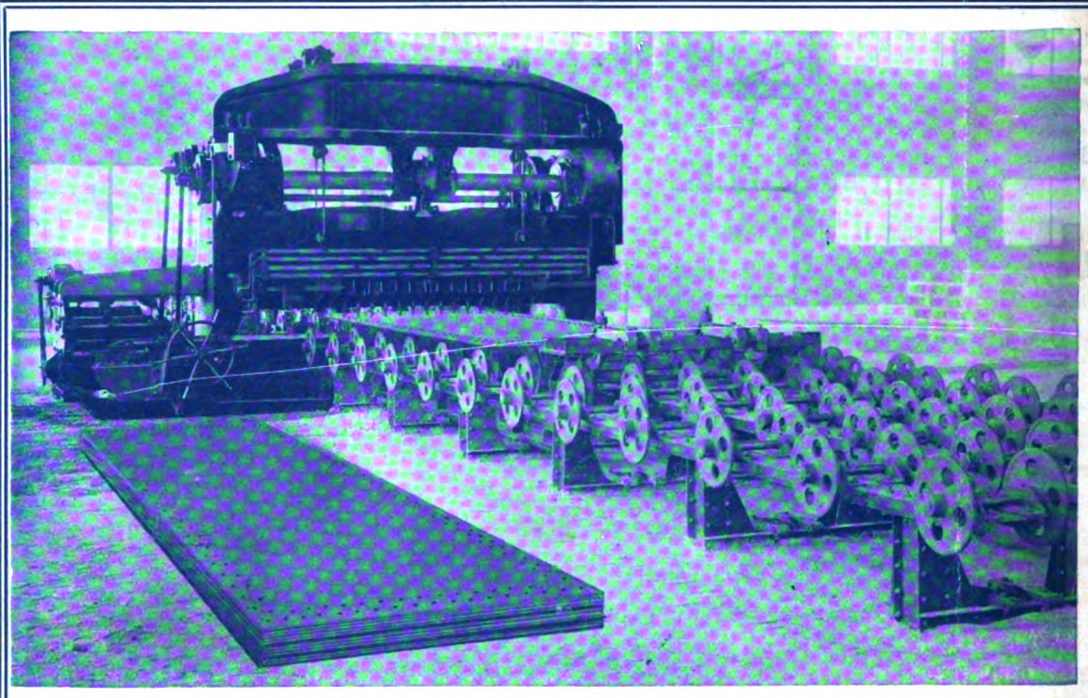


All Shapes

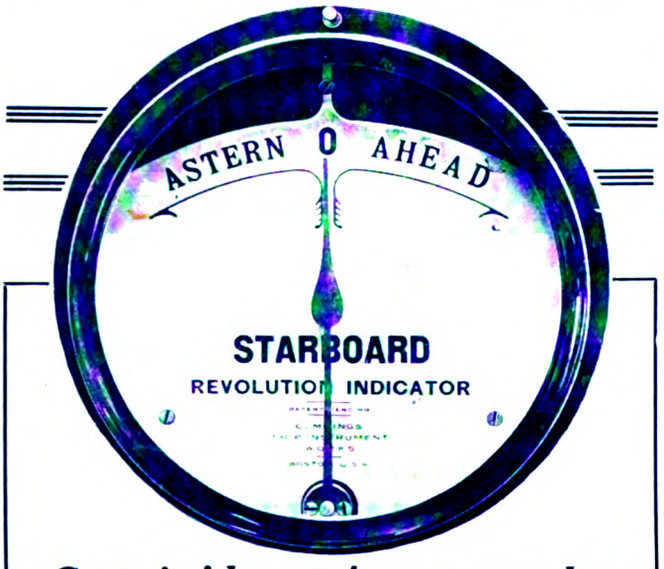
Rectangular
Curved
Skewed
Offset

THOMAS AUTOMATIC SPACING TABLE

FOR PUNCHING ALL KINDS OF PLATES

Ship—Steel Barges—Tanks—Boilers, Etc.

STANDARD BRIDGE TOOL CO., Pittsburg, Pa.



Captain! keep tab on your orders

THE

CUMMINGS

REVOLUTION INDICATOR

installed in the pilot house, instantly shows whether engine is going ahead or backing

Operated by a small rotary pump attached to main shaft and requires only a single line of small tubing from pump to bridge. Very simple and effective.

If interested write—

Cummings Ship Instrument Works

110 High Street .·. Boston, U. S. A.

TRADE PENBERTHY MARK

AUTOMATIC INJECTOR

No other INJECTOR on the market so simple, reliable or durable.

800,000 Engineers testify as to its merits. WORLD'S STANDARD.

The Penberthy Automatic is absolutely so, it is re-starting, self-draining. It is the ideal Injector for Marine use.

"XL--96" EJECTOR

On account of the great elevating and lifting power of the "XL-96" when using a minimum amount of steam, it is at its best when replacing the bilge pump.

Our No. 27 Catalog tells of these. Write for it—Now.

Penberthy Injector Co.

DETROIT, MICH.

Canadian Factory—Windsor, Ont.

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THE MARINE REVIEW

VOL. 46 CLEVELAND DECEMBER, 1916 NEW YORK No. 12

"WEW" VALVES

are especially made for Marine Service, and are thoroughly guaranteed in every respect.

CROSS VALVES; SNIFTING VALVES; RELIEF VALVES; THROTTLE VALVES; GATE VALVES; CHECK VALVES; OIL CUPS; GREASE CUPS; LUBRICATORS; TRY COCKS; WATER GAUGES; STEAM GAUGES AND STEAM COCKS.

We carry a full line of Bronze and Iron Body Valves in stock. Send at once for our catalog which shows the most important and most used types of valves. If the valve you require is not shown, remember we make it.

The "WEW" is the heaviest and best valve made.

WRITE US

WILLIAM E. WILLIAMS

62 FRONT ST., NEW YORK

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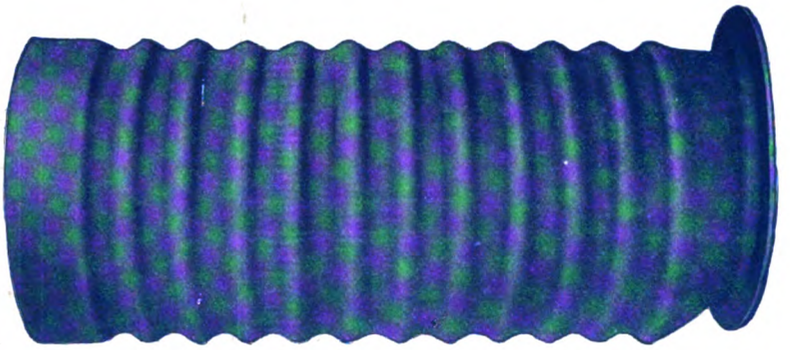
Morison Suspension Boiler Furnaces



For Land and Marine Boilers

Uniform Thickness, Easily Cleaned, Unexcelled for Strength.

Also FOX CORRUGATED FURNACES

Manufactured by

THE CONTINENTAL IRON WORKS

West and Calyer Sts., BOROUGH OF BROOKLYN, N. Y.

Greenpoint Ferry from East 23rd Street, New York

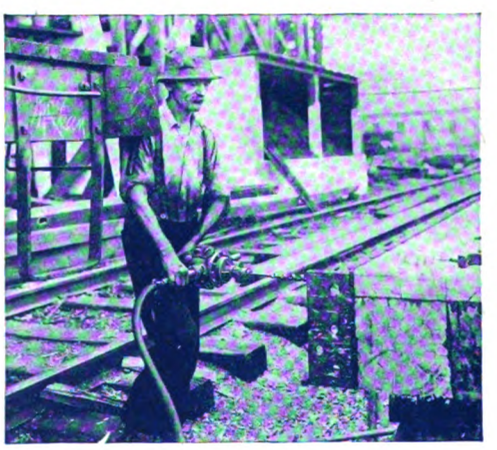
Thor

PNEUMATIC TOOLS

Develop the Greatest Power and Speed at the Lowest Cost. The only Air Tools you can afford to use.

Try a *Thor* at our expense

Size B. W. *Thor* reversible wood boring machine boring 1½" holes in oak timbers for launching ways.



Thor wood boring drills are made in three sizes, with capacities of one, two and four inches. Especially adapted for shipyard and dry dock use.

INDEPENDENT PNEUMATIC TOOL COMPANY

Chicago Birmingham New York Montreal Pittsburgh Portland Detroit Seattle San Francisco Vancouver

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Westinghouse
Marine Gears

The U. S. S. Melville

The propellers of the U. S. S. Melville are driven through Westinghouse Reduction Gears. The flexible pinion frame of the Westinghouse Gear provides means of compensating for torsional deflection and of insuring correct tooth alignment at all loads. The advantages of this construction are minimum wear, long life and a gear of great reliability.

The Westinghouse Machine Co.
Washington, D. C., East Pittsburgh, Pa.

Hunt, Mirk & Company
San Francisco - Seattle

The Westinghouse Machine Co.
Washington, D. C. - East Pittsburgh, Pa.
Hunt, Mirk & Company
San Francisco - Seattle

Marine Turbines and Reduction Gears, Condensers and Auxiliaries, Lablanc Air Ejectors, Lablanc Ice and Refrigerating Systems, and Turbine Driven Lighting Sets.

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Judge the Paper by Its Readers

BOOKSELLERS TO THE WORLD

BRENTANO'S
FIFTH AVENUE & 27TH STREET
NEW YORK CITY

Oct. 12th, 1916.

Office of Marine Review,
90 West St.,
New York City.

Gentlemen:

Mr. Vincent Astor,
Rhinebeck,
N. Y.
complains to-day, that the MARINE REVIEW is reaching him irregularly.

Will you kindly verify his address, and see that it is all right on your mailing list?

We remain,

Yours truly,

BRENTANO'S.

TC/JB.
SUBSCRIPTION DEPT.

Mr. Vincent Astor is generally known as one of this country's renowned financial captains. He is a man of big affairs. He does big things, thinks big things and reads big things the same as all men of authority do.

Mr. Astor has been a regular subscriber to THE MARINE REVIEW for a good many years. Through some postal defect his copies have not been reaching him promptly so he urgently requests that an effort be made to get future copies to him soon after they are published.

If Mr. Astor, a man of universal influence, recognizes THE MARINE REVIEW as authority on Marine subjects and feels keenly the absence of an issue isn't it evidence of the high quality of the paper? Doesn't it suggest to you the immense buying power of the readers of THE MARINE REVIEW?

THE MARINE REVIEW
CLEVELAND, OHIO

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